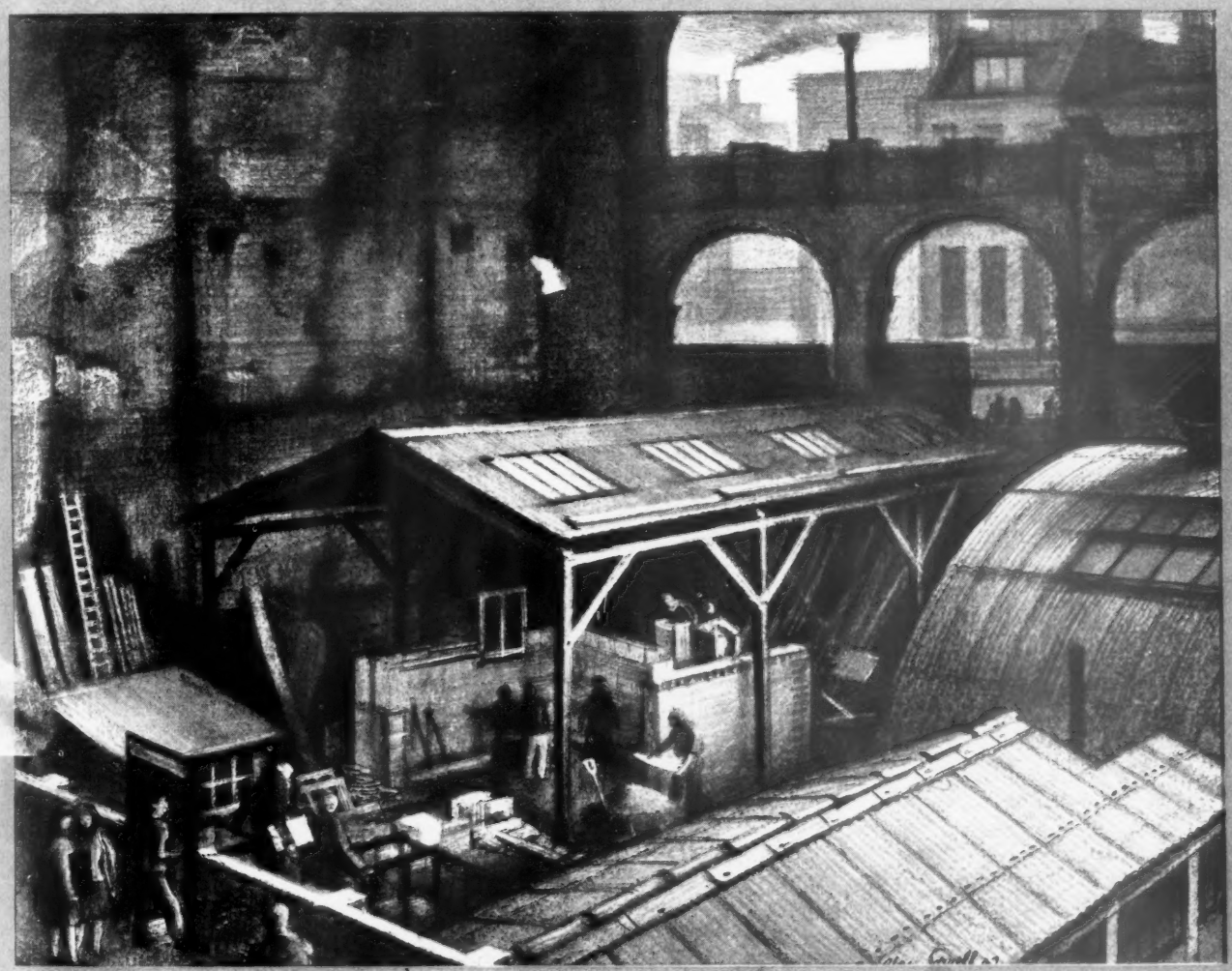
THIRD SERIES VOL 55 NUMBER 1 NOVEMBER 1947

THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

66 PORTLAND PLACE LONDON W1 · TWO SHILLINGS AND SIXPENCE



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Revision of the R.I.B.A. Scale of Professional Charges

In accordance with the decision of the Council reported in the last issue of the JOURNAL, a revised edition of the Scale of Charges is now being printed, and will be obtainable on application to the Secretary, R.I.B.A., from 1 December 1947. The attention of members is also drawn to the fact that Clauses 9 to 15 inclusive of the Scale, which are incorporated from the Schedule of Professional Charges of the Royal Institution of Chartered Surveyors, are being brought up to date with the latest issue of that publication.

The cost of the new edition of the Scale of Charges will be 3*d*. per copy (exclusive of postage), and members are requested to forward the appropriate remittance when ordering copies by post.

Christmas Holiday Lectures

This year's Christmas Holiday Lectures for boys and girls are to be given by Mr. Richard Sheppard [*F*], and will take place at 3 p.m. on Monday 5 January, Wednesday 7 January, and Friday 9 January.

The title of the series is 'The Making of Architecture' and the talks will try to explain how architecture is created, how man begins by using the materials he has to hand, and by gradually developing a mastery over them, adapts them with increasing exactitude and ingenuity to building. He will show how the process of adaptation is universal and continuous, and is to be seen in all countries and at all eras from primitive times to the present day. The conditions necessary to produce great architecture will be shown, and in particular the difficulties and opportunities which confront the architect today. Mr. Sheppard will illustrate his points with the use of slides and by describing the life and work of three architects—one living in the twelfth century, the second in the reign of Queen Victoria, and the third at the present day.

Young people can obtain their tickets free of charge by writing to the Secretary, R.I.B.A., and marking their envelopes 'Christmas Lectures' in the top left-hand corner.

Replanning Britain Exhibition

At the request of the British Council Mr. Anthony M. Chitty [*A*] will visit Italy to open the Exhibition at Milan, he will also deliver lectures on the town planning and housing problems of Great Britain. Members will recollect that this exhibition was first shown in Sweden and since then has visited several other countries, including Turkey, where Mr. Chitty attended and lectured on behalf of the British Council.

The Building Exhibition

When this number of the JOURNAL is published the first post-war Building Exhibition will have been opened at Olympia. The President, Sir Lancelot Keay, K.B.E., has consented to be chairman of the Exhibition. The promoters, Mr. H. Greville Montgomery [*Hon. A*] and Mr. Hugh R. G. Montgomery, M.C., are to be congratulated on their courage and enterprise in staging the exhibition at a time when things are far from bright for the Building Industry. It represents a declaration of faith in one of the fundamental industries of the nation which, given the chance—and what is equally important, the capital expenditure—is ready to fulfil the high hopes of creating a better Britain which filled all hearts at the end of the war. It is not too much to say that Britain leads the world in its ideas of architecture for the community. Foreign architects study our planning and housing schemes with intense interest, even though these still exist mostly on paper. The stoppage of building since 1939 has its credit side. It has turned architects as never before to study of planning, design and building technique.

Government Further Education and Training Scheme

The R.I.B.A. have been informed by the Ministry of Labour and National Service Appointments Department that, with certain exceptions, the benefits of the Government Further Education and Training Scheme will *not* be available to men who began their period of National Service under the National Service Acts after 30 September 1947. Certain other amendments and alterations have also been made to the provisions of the Scheme. The various amendments involved are set out in the revised leaflet P.L. 120, copies of which may be obtained from the Ministry of Labour and National Service or its Regional Appointments Offices.

The Reilly Scholarship

The proposal, announced in the last JOURNAL, to found a scholarship in honour of Professor Sir Charles Reilly, has been taken a stage further by a letter to THE TIMES appealing for funds. The letter is signed by Sir Patrick Abercrombie, Mr. Julian Huxley, Mr. Augustus John, Sir Lancelot Keay, Lord Leverhulme and Miss Diana Wynyard. The signatories make their appeal to a circle wider than Sir Charles's old students on the well-founded basis that he 'has ever been a man of many interests, always ready to fight in a good cause, whether it be the building of a repertory theatre, the creation of a chair of civic design, the development of architecture to encourage a better way of life, or the promotion of good international relations'. It is hoped to raise a capital sum of £5,000.

The Lectures on School Building

The conference or series of lectures on school building which is reported in this number of the JOURNAL, was easily the most successful and well-attended conference that anyone can remember at the R.I.B.A. All available seating was booked long before the conference was held. All the meetings were crowded and there was no sign of that falling off in attendance on the second day which commonly occurs at conferences.

At the risk of being invidious we can say that the principal highlights of the conference were Mr. Clarke-Hall's exposition of plan forms, Mr. Harrison's practical approach to the problems of the school architect, Mr. Hope Bagenal's imaginative and witty description of the functions of the assembly hall, culminating in a peroration on school architecture in general which almost drew cheers from the audience, Mr. Allen's fascinating description of research into the shapes and colouring of glazing bars and window reveals—pure research into æsthetics, Mr. Handisyde's trick of stating facts about heating by asking apparently guileless questions, and Mr. Fitzmaurice's account of how much coal it takes to provide different types of building material.

The Minister of Education detailed the Government's proposals for the school building programme. There was some despondency later when an announcement appeared in the Press that school building was practically to cease. The Minister immediately issued a correcting note to the Press in which he said: 'Many of you will probably have read with some dismay that there is to be a stoppage of school building after June next year. I want to make it quite clear on behalf of the Government that this is not correct. What Sir Stafford Cripps said yesterday was that the educational building programme up to next June will go through without any curtailment. Beyond that time we do not quite know what the position will be, but we rather think that we shall not be able to expand that programme *above the level of activity in June*. There is no question of the educational building programme coming to a dead stop at the end of next June. The only doubt is whether we shall be able to expand the programme after that date'.

A small but business-like technical exhibition of school planning and design was held in the Foyer in connection with the lectures; this included some of the most recent plans of various types of school. The Building Centre staged a small exhibition of school furniture and equipment and gave a tea party to those attending the lectures.

In reporting the conference we have, for reasons of space, to postpone publication of the two last lectures until the December JOURNAL, together with illustrations of some of the plans from the exhibition. It is hoped to reprint the whole report and the plans from the exhibition in a pamphlet. This depends on obtaining the necessary supply of paper.

Planning Abroad

The Town and Country Planning Association announce a new series of evening lectures at the Planning Centre, 28, King Street, Covent Garden, W.C.2, on 'Planning Development Abroad'. By the time this notice appears the first two lectures will have been delivered, namely, *Introductory Lecture* by Mr. G. L. Pepler [*Hon. A*] and *Czechoslovakia* by Mrs. Monica Felton. The following is the remainder of the programme: 26 November, *Sweden*, T. F. Thomson [*L*]; 3 December, *Switzerland*, Herbert Jackson [*F*]; 10 December, *Holland*, W. L. Waide; 17 December, *Denmark*, F. R. Stevenson [*A*]; 7 January, *Germany*, Robert Nott; 14 January, *Poland*, R. Nicholas; 21 January, *U.S.A.*, F. J. Osborn; 28 January, *Russia*, Arthur Ling [*A*]; 4 February, *France*, Gordon Stephenson [*F*]; 11 February, *Belgium*, to be announced; 18 February, *Summing Up Series*, R. L. Reiss. Lectures start at 6.15, fees for the course are 17*s.* 6*d.* and for individual lectures 2*s.* Special rate for students 10*s.* 6*d.* and 1*s.* 6*d.*

Eighteenth-century dressing chest presented to Her Royal Highness Princess Elizabeth by the Royal Institute as a wedding gift of British Architects

The A.B.S. Tombola

The response to the request for gifts has been good. It now remains for members visiting the Building Exhibition to visit the stand of the Architects' Benevolent Society and to buy a ticket (or tickets) at one guinea each. The whole of the guinea will go to the funds of the A.B.S. without any deductions, Mr. H. Greville Montgomery having kindly undertaken to defray all charges. Members should also not fail to read the President's letter enclosed as an inset in this JOURNAL.

Mr. Bryant Newbold

We offer our best wishes to Mr. Bryant Newbold [*F*] on his retirement from the Editorship and control of the OFFICIAL ARCHITECT AND PLANNING REVIEW which he founded 10 years ago. We also offer him our congratulations on the success of his journal; there were many who said at the beginning 'It will never last' or 'There is no room for another architectural paper'; Mr. Newbold has confounded all these critics. Essentially a fighter, he wrote leaders fiercely advocating the claims of official architects, assailing the R.I.B.A. Council when he thought it neglectful of their status and rights, while recently, the old controversies forgotten, he tended to turn his guns on the Socialist Government. We wish him all happiness in his retirement.

On the Cover

The Practical Training Section and temporary studios on a blitzed site at the Architectural Association School of Architecture. From a drawing by Alan Sorrell, specially drawn for the R.I.B.A. JOURNAL.

R.I.B.A. Diary

TUESDAY 25 NOVEMBER 6 P.M. General Meeting. *The Picturesque in Architecture*. Dr. Nikolaus Pevsner.

TUESDAY 2 DECEMBER 6 P.M. A.S.B. Lecture. *Choice of Structural Type and its Cladding*. R. Llewelyn Davies [*A*].

TUESDAY 9 DECEMBER 6 P.M. General Meeting. *The Architects' Responsibility for Industrial Design*. John Gloag [*Hon. A*].

TUESDAY 13 JANUARY 6 P.M. General Meeting. Award of Prizes and Studentships. Criticism by Ralph Tubbs [*A*] on work submitted.

Centenary of the Architectural Association

Above: Lyon's Inn Hall, Strand, the first home of the A.A. Below: the present premises in Bedford Square

Message from the President of the R.I.B.A., Sir Lancelot Keay, K.B.E.

AS PRESIDENT I should like to convey the congratulations of all members of the Royal Institute to the President and Members of the Architectural Association on the occasion of its Centenary. The 'A.A.', as it is more familiarly known, has experienced its ups and downs, but it has successfully braved its storms. Today it is as virile as it was thought to be rebellious when it set itself out to cater for the needs of the younger men of our profession.

Many a distinguished name is to be found on its long list of members. It has been the training ground for many who have given great service to us and no less than nine of its Presidents have succeeded to the Presidential Chair of this Institute.

No one can read the history of the 'A.A.' without realizing how it has been stimulated by lectures and discussions upon all that is vital to our art. I hope that this phase of its activities will long continue and that as the years go by the associations so well established between the two bodies will be strengthened so that we present a united front for all that is best in architecture.

Architecture and the A.A.
By Anthony M. Chitty, M.A., A.A. Dip. [*F*], Hon. Secretary of the Architectural Association

THE CLOSE of this year is marked by the centenary of the Architectural Association, which operates the best and foremost of the English schools of architecture. This might perhaps be considered an incautious claim to fame, but those who have read John Summerson's excellent history of the school, just published, and then consider the position of this school in the field of architectural education today may justifiably agree.

For the Association has from the start in 1847 until today been the very spearhead of education for the coming architect, as well as a symbol of many other essential factors and qualities in the profession. Not only was the A.A. the first architectural school, but it has the special characteristic of being the only such institution to have been started by students themselves. Other schools of architecture gained exemption from the Intermediate examination about the same time as the A.A. (1906) or even a few years before. The A.A., however, had by then not only survived half a century of ups and downs but, more important still, was the original instigator of these very examinations at the Royal Institute.

In the beginning, as the Association of Architectural Draughtsmen, the intention of its members was, as now, twofold: first, to improve architectural standards; and second to create a club or common meeting ground for the discussion of just those subjects which perennially occupy the minds of both students and architects. The precise wording of the objective was 'to endeavour to revive the ancient spirit of Architecture'.

There can be few (if any) other schools of architecture that have attached as much importance to the duties and responsibilities of a club as is the case at Bedford Square. The exchange of information and gossip, the placing of students in the way of suitable jobs both during and after the course, the entertaining General Meetings, the services of the library and the slide collection, the provision of food, drink and rest—all these things are considered to be the essential counterpart of a very good training.

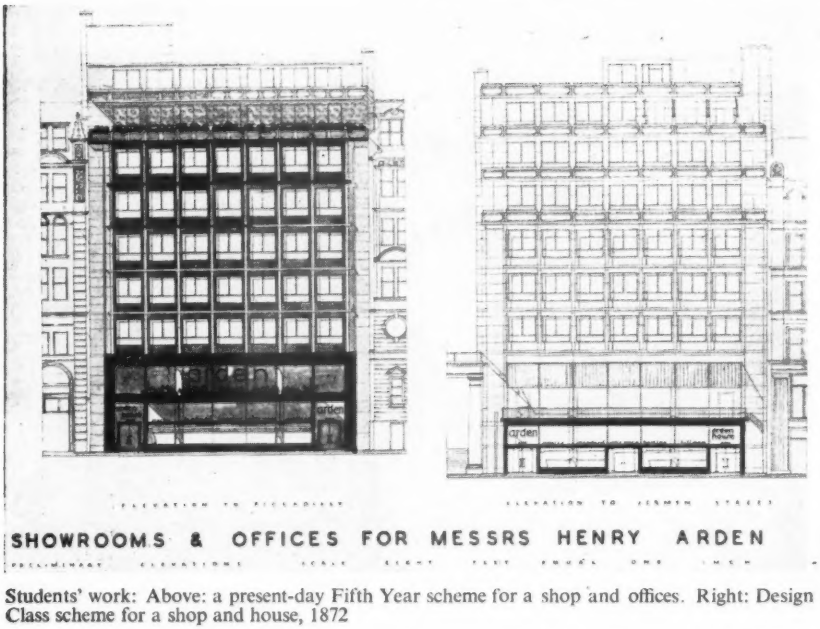
It is interesting also to note that so many of the famous names of the profession in the last century are to be found in the A.A. lists, either as members or 'visitors' giving instruction or lecturing—Ruskin, Norman Shaw, Stokes, Webb, Voysey, Gilbert Scott, and many others; nine Presidents of the A.A. have later become Presidents of the Royal Institute of British Architects.

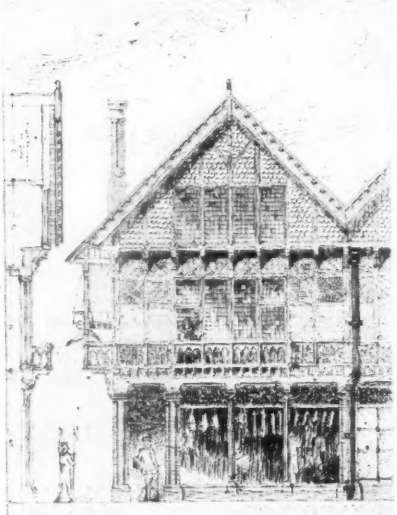
From earliest days one of the A.A.'s special functions has been to organize architectural visits at home and abroad, and especially to knit up its members with the architects and students of other European countries. This function became of especial importance during the interwar years. Foreign tours were organized in the summer holidays, full of interest and entertainment, to Sweden, Denmark, Holland, Switzerland, France, and Italy. This was by no means a one-way affair, many of the foreign architects later visiting this country. Even in this unblessed year of 1947 it was possible for the A.A. to organize a successful tour for 60 Swedish architects, which included a week in the West of England and a week in London.

In architecture, as noted above, the A.A. stands in the vanguard both as to educational motive and in the sense of design achievement. The intention of the founder students of the A.A. (and it should not be forgotten that it was founded by students and for students) was, in the words of Summerson, 'to stir dry bones'; to enliven the eclectic controversies of the period; to replace the sterility of the older men's design; to revive architecture.

Most of us are familiar with what Summerson calls the A.A.'s Second Period, the interwar years, years of political and architectural ferment. Out of this stress and strain grew gradually a set of architectural ideas and principles which have stood the test of time and are now accepted, sometimes even in Philistia. Whereas in the thirties we looked round-eyed and unquestioning to Sweden for our inspiration, today we are able to criticize coolly not only our own work, but that of other countries.

The atmosphere of an architectural school: Above: A.A. premises 1903-17, the Royal Architectural Museum. Right: temporary post-war studio, Bedford Square





Students' work: Above: a present-day Fifth Year scheme for a shop and offices. Right: Design Class scheme for a shop and house, 1872

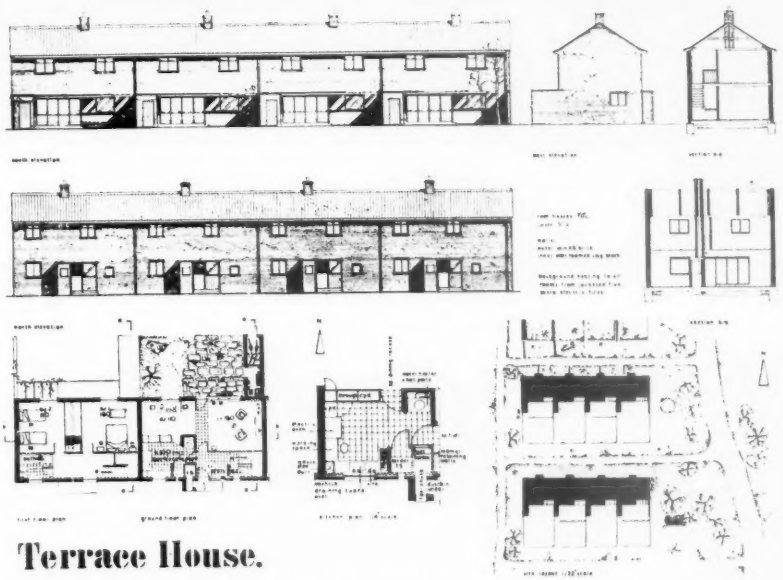
We can see signs that our English modernism will settle to a maturity unknown before the war, accepting a need for colour, texture and quality that will free us from the gaucherie of that epoch. That these and other qualities are found for the moment more in our hearts than in our building is a harsh necessity. The A.A. has undoubtedly been at all times a large and potent element in this movement, its personnel a force, its premises a forum and a springboard.

How will the A.A. face the future? Education of the architect in the future presents one facet of the great problem which grows in difficulty with every generation and is common to all technical professions: the problem of how to absorb the ever-increasing volume of knowledge, both within the shortness of a five-year curriculum, and after, during the stress of practice; the problem of becoming a specialist in a dozen sciences while still maintaining a broad and balanced view.

For a hundred years the A.A. has faced every crisis with a bold and energetic policy, and this in bad times has turned the tide. One can be sure that this tradition will endure even in the present period of professional decline. The A.A. recognizes its duty to turn out from the school more than 'an able assistant'—the whole training is directed towards a far broader, more balanced and informed background against which to practise architecture. Already since the war ended the trend away from the perils of over-specialization is being felt in the school and discussed in Council. Proposals for a country summer school are in the air, for it is felt that the urban setting of Bedford Square is not in itself sufficient. This is the direct outcome of the school's sojourn at The Mount House, Hadley, during the war years, a location that though partially cut off from some of the advantages of the metropolis, yet gave complementary benefits, such as country sights and sounds, leisure to open the eyes and see, sketching, and the simple charms of colloquial country building. A combination of Bedford Square and a country school may prove to be the happy fusion of these two worlds.

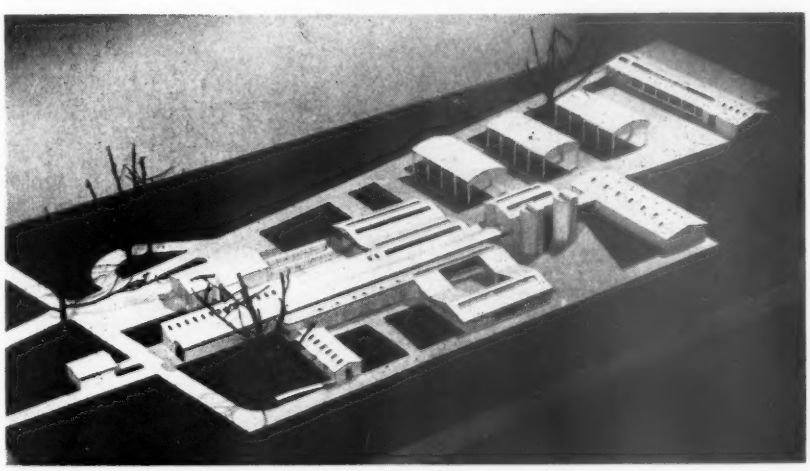
The formidable problems of post-war reorientation in the school together with these larger problems will be tackled with

Above: Third Year scheme for a complete village by students working in groups. The types of housing, the hall, church, shops, pub, etc., were worked out in detail. One week was allowed for making the model. Right: a typical group of houses from one of the village schemes. Below: model of a Third Year scheme for a farm



Terrace House.

VILLAGE DEVELOPMENT SCHEME, BUCKS

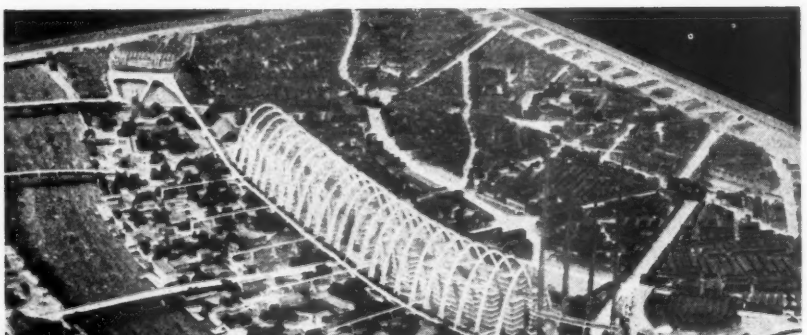


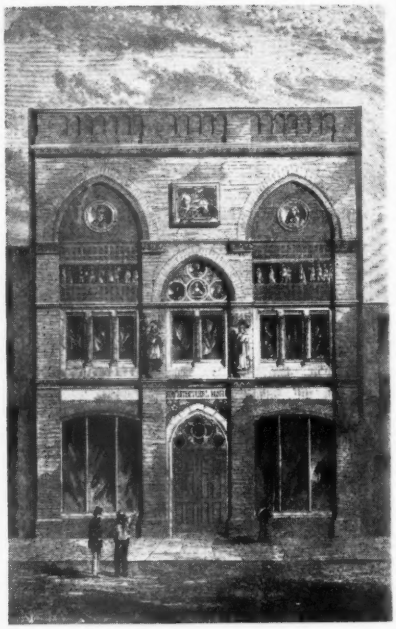
the energy and boldness of which we have already had experience under Mr. Gordon Brown, the present Principal. This work has involved a new and enlarged curriculum, increased teaching staff, and new accommodation. The increasing bulk of scientific fact to be assimilated is now so great compared with the field of 1847 that in the future one must look towards compression of the curriculum; to the excision of much now taught in the mechanical and scientific fields; to concentration upon principles rather than to excessive detail; while in the art and history background perhaps we must consider pre-entry courses, and acceptance as read of much that is now included in the course.

The practical training course at the Morwell Street premises, an experiment in first-hand contact with building materials, is again a widening of the educational scope. Begotten by the Bauhaus out of the old A.A. Samples Bureau, this course has already gone some way towards teaching the student that practical attitude to building, without which no man should call himself an architect. In the past it may have been said of A.A. students that their training was so full and wide as to cut short their practical knowledge of building. Many other schools have to a marked degree the converse fault —a knowledge of construction with little sense of design. At the A.A. it is felt that during the irreplaceable school years the emphasis may more fruitfully be placed on the learning of principles, the greater part of practice being acquired at a later stage. The practical training course may prove to be a useful compromise between two opposite points of view.

Programme of the Centenary Celebrations

The full programme has been issued to members of the A.A., to official guests and





Above left: model of a factory in a rural setting for printing Penguin publications, a Fifth Year subject. Below left: model of a Fifth Year scheme for the 1958 Exhibition on the South Bank site. Above: the A.A. premises, 1903-17

to the Press. The guests will include a large number of delegates from the Empire and from foreign countries. Under prevailing conditions it has been necessary to limit the number of functions that can be made available to the entire membership, so that the programme contains two types of function, namely, those which are open to all and those which are open only to delegates, guests and members of the Council.

Wednesday 17 *December*, 11.30 a.m. Reception of Delegates by the President and Council at 36 Bedford Square. 2.30, Opening of the Exhibition illustrating the history and activities of the A.A. during the past 100 years, at 36 Bedford Square. Speakers will include Sir Ernest Pooley, K.C.V.O. (Chairman of the Arts Council of Great Britain). Tea. 8 p.m. The President's Reception and Dance at the R.I.B.A.

Thursday 18 *December*. 11 a.m. Commemoration Service at St. George's Church, Bloomsbury. Preacher: The Very Rev. the Dean of St. Paul's. Collection in aid of the Architects' Benevolent Society. 2.45 p.m. Conference at 36 Bedford Square (details to be announced). 5.30 p.m. Entertainment of Delegates by the British Council. 8 p.m. Gala performance of Students' Pantomime at the R.I.B.A.

Friday 19 *December*. Morning and afternoon: organized tours of London and Home Counties for Delegates. 7.30 p.m. Dinner in honour of the Delegates, given by the President and Council at 36 Bedford Square. 9 p.m. Students' Dance at 36 Bedford Square.

The Students' Pantomime will be held at the R.I.B.A. on the following dates: Friday 12 December, 7.30 to 10; Saturday 13 December, 3 to 5.30; Monday 15 December, 7.30 to 10; Tuesday 16 December, 7.30 to 10; Thursday 18 December, 8 to 10.30. Tickets may be purchased only by members of the Association. Prices: 2*s*. 6*d*., 3*s*. 6*d*. and 5*s*. The Gala Performance prices are: 3*s*., 4*s*. 6*d*. and 6*s*. Tickets from Mr. R. Gazzard, 36 Bedford Square, W.C.1. Cheques payable to the A.A. Students' Club Committee and crossed Panto a/c.

The Centenary History of the Architectural Association by Mr. John Summerson, F.S.A. [*A*] *is reviewed on page* 37 *by Mr. Austen Hall* [*F*].

School Planning and Construction

Report of Lectures at the R.I.B.A. 23 and 24 October 1947. Part I

The President, Sir Lancelot Keay, K.B.E., *welcomed the delegates and said it was evident from the size of the audience that the subject was a very popular one. He hoped that by the end of the conference all those who had taken part would feel they had learnt something, and that their attendance had been worth while.*

Secondary Schools: Denis Clarke Hall, A.A.Dip. [*F*]

MR. CLARKE HALL said he had found it difficult to confine his remarks to secondary schools because nearly every important factor in the regulations was applicable to all types. In the new Act, secondary schools included all post-primary schools teaching senior pupils between the ages of 12 and 18. The building regulations laid down a detailed schedule of accommodation for three main groups of secondary school—one, two and three form entry—sub-divided into thirteen types and variations. There were also many local variants.

From the architect's point of view the chief differences between secondary and primary schools were in the schedule of accommodation and details of fittings, though there were well-known differences in classroom accommodation. Other differences were that the area in sq. ft. for each pupil was more than twice that in primary schools and that the playing field area per pupil was also greater. Mr. Clarke Hall continued :

'The actual plan pattern of schools is continually changing, and Diagram 1 illustrates this for secondary schools. Fig. 1, the old quadrangle plan, that did not take into consideration orientation, light, or accommodation segregation, nevertheless had two advantages: that of ease of supervision and economy in plan. Fig. 2 shows the NEWS CHRONICLE plan, which introduced lighting standards above the 5 per cent now recommended, and was planned for acoustic segregation, all the noisy areas being to the North West of the central corridor. Fig. 3 shows an application of Fig. 2 at Richmond, Yorkshire. Fig. 4 is the post-war application of the Building Regulations to a secondary school at Ruislip, by Mr. Lobb, while Fig. 5 shows an entirely different conception by Mr. Stillman, of a school as a series of disconnected buildings of light flexible structure grouped round a more solidly constructed central block of the assembly hall group.

While the new building Regulations are in many ways similar to the pre-war practices, there are three outstanding features that basically effect the design of secondary schools.

1. The increased area of accommodation, notably in classrooms, giving almost one classroom to each class in the school.
2. The accommodation for meals.
3. The standard of natural lighting.

These alone have made almost every existing school in England sub-standard, and a very large percentage cannot be economically brought up to requirements. Before the war, there were generally not nearly enough classrooms in secondary schools for a form room for each class; now, however, there is to be a classroom for nearly every class. A comparative analysis of the areas recommended in Board of Education pamphlet No. 107 in 1938 and of those given in the new Regulations shows an overall increase of approximately 40 per cent. Examples of this area :

	Per cent increase
Playgrounds	17
Assembly Halls	40
Classrooms	54
Practical Rooms (including Art Rooms and Laboratories) ..	28
Gymnasium	34
W.C. Area—Boys	36
W.C. Area—Girls	45

These figures are only approximate, and have been taken as a total of the accommodation prescribed in the two documents.

Apart from this increase in the existing type of accommodation, there is the dining and kitchen block, which is a new feature that will in future be seen in all schools, whether old or new. The relative importance of this block in relation to the school plan can be seen by the fact that the floor area of the block for any particular type of school is generally slightly larger than that of the assembly hall. In new schools this will more often be planned as an integral part of the plan, but in the case of existing schools, completely disconnected blocks, built of standard hutting components, are being put up by the Ministry of Works under the Ministry of Education school meals programme, as a temporary measure.

While it is generally a comparatively simple matter to increase the existing accommodation such as teaching rooms and lavatories by the addition of new blocks or wings, it is extremely difficult to enlarge existing halls and gymnasia. This, together with the lighting requirements, are two of the biggest problems in bringing existing buildings up to date, and to which, I am afraid, I cannot see any satisfactory economical solution.

Coming to the last of my three points, that of natural lighting, this is a very controversial point, and many consider the standard set unnecessarily high, of little value, and impossible to achieve economically. Whatever view is taken, it is a Statutory Order, and until such time as it may be amended, must be carried out as far as possible. In my opinion, this one regulation introduces problems that affect the whole design, layout plan and structure more than all the others put together. The normal classroom window arrangement used before the war does not give this standard. Post-War Building Study No. 12, 'Lighting of Buildings', gives various examples of lighting, and shows that where the main windows are on one side with small ventilators over the corridor on the opposite side, the daylight factor drops from over 30 per cent to less than 1½ per cent. Where windows are used on both sides, one side getting borrowed light from a corridor, the minimum daylight factor is raised to approximately 2 per cent; 5 per cent is reached only if the corridor is in the form of a covered way and is completely open on one side.

The result of this is to reduce the size of the main windows, on the south-east to introduce canopies, and to increase the size of the windows on the opposite side. Glazed partitions between classrooms are most unsatisfactory, as a large part of the school can be distracted by one child going to the lavatory. It is, therefore, necessary either to break away from the series plan, where the corridor runs parallel and next to the teaching rooms, or to introduce top lighting in some form. Whether top lighting or two windows are used, they directly affect both structure and appearance, and in the second case, the whole plan and layout.

The Americans have worked out some extremely interesting sections using reflected and controlled light from the top, but these have, in nearly every case, been

designed for hot climates where the exclusion of sun is a major problem, and so are not suitable for this country. Before leaving the question of light, I should like to discuss the angle of the source of light to the line of vision. The Americans have found that the angle between these should not be less than 50 degrees. Below this, the source of light tends to cause glare. Applying this to windows as a source of light, it becomes necessary either to arrange the desks as shown in Diagram 2, Fig. 2, or to arrange for fins to project from the windows as shown in Fig. 3. The latter has the advantage of tending to even out the daylight factor curves, as it reduces the amount of light falling on the desks near the windows to a greater extent than those farther away. At the moment when the size of classrooms is just large enough to get in thirty desks, the arrangement shown in 2 is impracticable, but if the sizes of the classes are reduced at a future date, this arrangement should be possible.

The next series of diagrams have been drawn to illustrate various principles that can be applied to obtain the required daylight factor. It will be noted that in the case of single-storey structures the plan form need not vary if top lighting is used, but when two or more are required, the plan types used before the war are no longer suitable.

Diagram 3, Fig. 1 A is the normal series planning where it is necessary to introduce top lighting. This plan is the same as that in normal use before the war, where secondary lighting was introduced over the corridor, and was projected to two or more floors, but as top lighting in some form is now required, it is limited to positions where there is no building over. Figs. 1 B and C show the separated series method with windows on opposite walls. One problem introduced by this method is the interference of one classroom with another. This effect can be minimized by the use of intermediate screens, or some obscured and insulated glazing on the north-west side. The distance between classrooms should be about 40 ft. At first this appears to be an uneconomical use of space, but in the case of 1 C, the double banked plan gives six classrooms to about 140 ft. run compared to six classrooms to about 150 ft. run, using the normal series planning in 1 C. The selection of plan type is often determined by the site. For example, in the series plan type the main run of the classroom blocks is on the south-west—north-east axis.

Fig. 2 A and B shows the elbow access plan. A is generally preferable to B as it avoids the enclosed courts, but is more extravagant in running lengths of classes and in the number of external walls. The distance between the classroom and the main corridor should be about 20 ft. If 2 B is used it is advantageous to cover the corridor wall with either bushes or creepers to deaden the reflected sound. In both cases the main run is on the north-east—south-west axis.

Fig. 3 shows the diagonal elbow access plan. This has the disadvantage of small

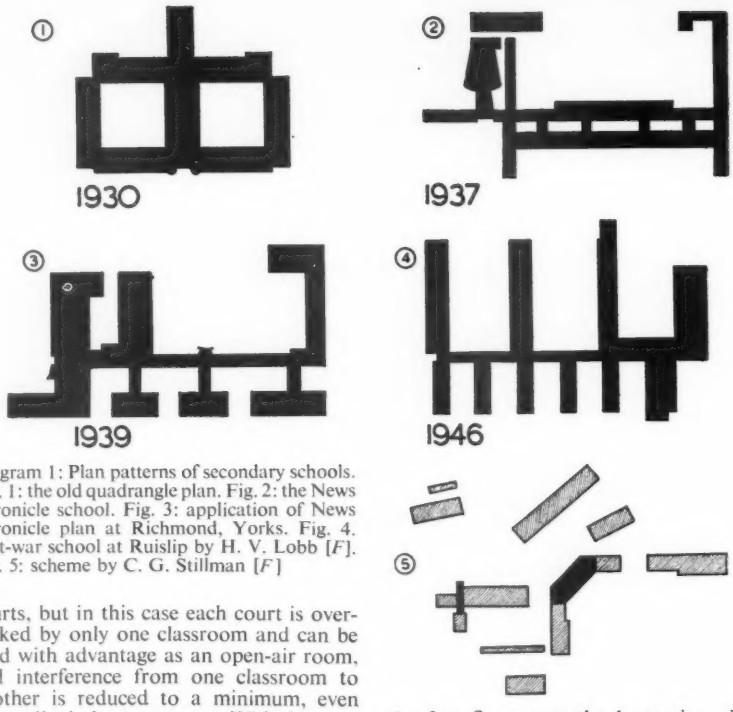


Diagram 1: Plan patterns of secondary schools. Fig. 1: the old quadrangle plan. Fig. 2: the News Chronicle school. Fig. 3: application of News Chronicle plan at Richmond, Yorks. Fig. 4. Post-war school at Ruislip by H. V. Lobb [*F*]. Fig. 5: scheme by C. G. Stillman [*F*]

courts, but in this case each court is overlooked by only one classroom and can be used with advantage as an open-air room, and interference from one classroom to another is reduced to a minimum, even when all windows are open. With this type of plan the main run can be either on the north-south axis as shown or, if the windows and walls are reversed, on the east-west axis. From the point of view of reducing heat loss, the series plan is obviously preferable, having only one outside wall in the centre rooms and two for the end rooms, while the separated series and separate elbow access plans have three outside walls, and the diagonal access has all four walls on the outside. However, one great advantage that is gained by having windows on opposite sides is in the control of ventilation, and the free, even flow of air at all levels in summer.

From my remarks it can be seen that, while the various plans with windows on opposite walls may have many advantages, the series planning with top lights can generally be regarded as the most economical if it can be used. There are, however, cases where the series plan is impossible.

I have already mentioned that, because of their size, secondary schools tend to be on two or more stories, and in the case of large schools in heavily built-up areas, multi-storey schools cannot be excluded. While adequate daylight can easily be obtained in single-storey schools, it is a greater problem in two and multi-storey buildings.

Diagrams 4 to 8 illustrate methods of planning that might be adopted to achieve the required standards of lighting. Diagram 7, Fig. 1, shows a very high room on the ground floor with the upper classrooms and corridor cantilevered out. This was illustrated in the R.I.B.A. JOURNAL of January 1946. Fig. 2 shows how top lighting can be kept on both floors by putting the first floor over the lavatories, cloakrooms, etc. To retain the orientation of the teaching rooms, the lavatories must in this case run parallel to the teaching rooms, so giving a combination of elbow access planning and series planning. This method has the great advantage that the height of the first floor slab can be reduced from about 12 ft. 6 in. to 9 ft. 6 in. so cutting down the length of vertical circulation.

Fig. 3 shows a variation when the lavatories are planned at right angles to the ground floor teaching block. In this case a combination of series and separated series planning is used.

Fig. 4 shows an example of the separated series plan, extended to two or more stories, with lavatories on each floor. The space between the rooms would naturally vary with the number of floors. Diagram 4 shows another example of planning the first floor over the lavatories, but in this case the elbow access plan is used, with the windows on both sides. In this plan one staircase serves two rooms on each floor. The extravagant use of staircase is more than compensated by the elimination of corridors on the upper floors. In this case a door must be provided between the central rooms to give alternative escape in case of fire.

Diagram 5 shows the elbow access plan projected to two or more floors. This has the disadvantage that the height of the lavatories and corridors is the same as that of the classrooms, but this may be got over by changing the levels in section and introducing stairs in the branch corridors. In this way it would be possible to get four floors of lavatories, corridors and stores into three floors of teaching rooms.

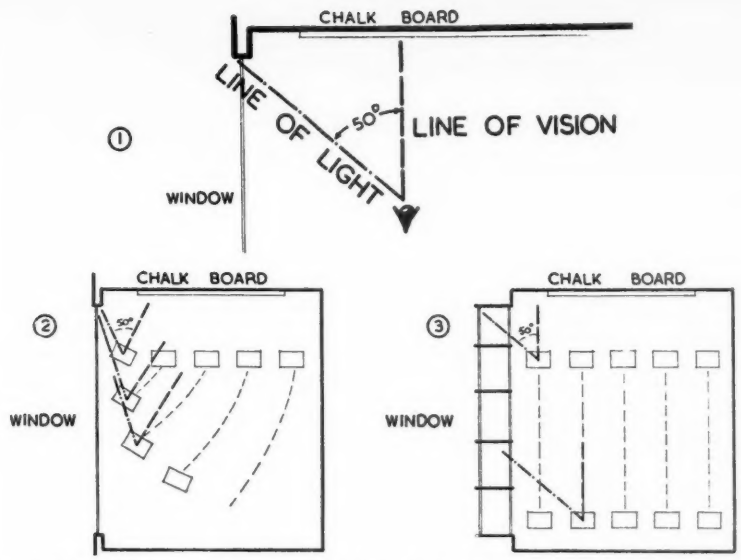


Diagram 2: Daylighting. Fig 1: to avoid glare the angle should not be less than 50 degrees. Fig. 2: desk arrangement to preserve 50 degree angle. Fig. 3: vertical fins at window to preserve 50 degree angle

Diagram 6 shows a method whereby there are no teaching rooms on the ground floor, and stairs serve double rooms and isolated groups of lavatories. The plans that have no corridors on the upper floors make it necessary for the pupils to go down and up when moving from one class to another, and so are more suitable for two-storey buildings than multi-storey.

Diagram 8, Fig. 1, illustrates a method whereby the lavatories and corridors are on every other floor. This plan would be very economical in construction and suitable for multi-storey buildings. Fig. 2 brings one back to earth and shows a method whereby all lighting is from the top, allowing for doubled banked series planning, the windows being for vision only. The illustrations I have given are intended only as examples of the principles of some possible methods. Each is open to a number of possible variations.

While the Building Regulations and the Memorandum are extremely comprehensive, they leave out one factor which I consider of very great importance, that of acoustic isolation of buildings and the acoustics within the buildings themselves. In the past this has been little considered, except perhaps in the case of certain assembly halls designed for theatrical and concert performances. In general, the choice of materials for internal finishes has always been towards hard-wearing surfaces that are claimed to be easy to keep clean, but are acoustically bad. This policy has had an extremely detrimental effect on the amenities of the school, and is a cause of considerable strain to both pupils and teachers alike.

Generally, the problem of acoustics fell into three parts: 1. Airborne sounds, which could be overcome by careful planning. 2. Structure-borne sounds along heating pipes and through thin partitions, particularly glazed partitions. 3. Internal acoustics, which was mainly a matter of internal surfacing materials.'

A factor in post-war planning which was having an even greater effect on design than the Act, was the shortage of materials and labour; this dictated at the moment the type of structure and the appearance of buildings. Concrete, if used, had to be mainly repeat pre-cast units using standard shuttering, and steel had to be in its most economical and available form, small sections being almost unobtainable. The labour shortage tended towards an increasing use of standard shop prefabricated parts; further, uncertain delivery times often made it necessary to re-design completely parts of the structure to keep pace with the changing materials situation. Mr. Clarke Hall continued:

'To meet these overriding problems it is necessary first to design for the most economical use of materials in short supply and using the type of labour that is least difficult to obtain; secondly, to design a structure that allows for a segregation of trades during erection, so that one trade is not dependent on another, which is in turn dependent on an uncertain delivery date; thirdly, to design in such a way that one material can be interchanged for another with the minimum amount of revision to drawings; and, finally, to gain a balance between site work and shop fabrication to allow the greatest ease and economy in site erection, together with the greatest flexibility, to meet the many variations of schools and sites. The great difficulty of standardization that conforms to the Building Regulations can be seen when it is realized that in the Regulations and Memorandum no less than fourteen different sizes of teaching room are given, ranging in area from workshops of 1,200 sq. ft. to preparation rooms of 250 sq. ft., and seven sizes of assembly halls.'

There were three lines of approach to structure. First, to ignore standardization or dimensional co-ordination, and to use traditional methods. This approach was satisfactory for extensions and small schools, but not applicable to the programme as a whole. The second method was the extreme opposite, namely, to develop complete prefabrication. This had many great disadvantages. To get economical construction the number of variations of room areas had to be considerably reduced, which meant that several rooms were larger than those given in the regulations. This used more materials and required extra fuel consumption. The third method was a balance between these two extremes whereby the overall sizes of certain essential components were determined, so making it possible to use a variety of materials and plans within these limitations.

The second and third methods had been studied in *Post-War Building Studies No 2: Standardization of School Buildings*. Emphasis was laid on the grid system, using a rigid square grid of 8 ft. 3 in. This raised many practical problems. Mr. Clarke Hall said these could be summarized as follows:

'1. The necessity of a square section for the stanchions, which is structurally wrong, and has the same dimensions for a stanchion of 8 ft. 6 in., carrying a span of, say, 8 ft. 3 in., in corridors, as one 18 ft. high carrying a span of 41 ft. 3 in. for assembly halls or gymnasia.

2. The necessity to break the grid to conform to site irregularities, such as changes in level, or blocks at angles other than right angles.

3. The increase in accommodation over the room areas laid down in the Regulations, giving an average increase of approximately 17 per cent on teaching rooms alone. For example, the nearest that it is possible to get to the 480 sq. ft. classroom is three grids square or 24 ft. 9 in. by 24 ft. 9 in., which gives a room just over 612 sq. ft. Allowing for wall thicknesses, this is reduced to about 580 sq. ft., an increase of over 20 per cent. In a three-form entry secondary school having ten such classrooms, this would be approximately 1,000 sq. ft. excess area, the equivalent of just over two classrooms.

The second method put forward in the Wood Report visualizes the school building as a series of blocks linked by in situ connections, each block being made up of a series of bays, in which the dimensions of the bay have no relationship to those of the span, the principle being like a train that is made up to any size and type by connecting a series of standard coaches or wagons by flexible connections. This method was recommended by the Ministry of Education in a recent circular on the operational programme for schools.

This method is very adaptable and forms a balanced combination of prefabricated elements and in situ work necessary to meet the great variety of conditions found

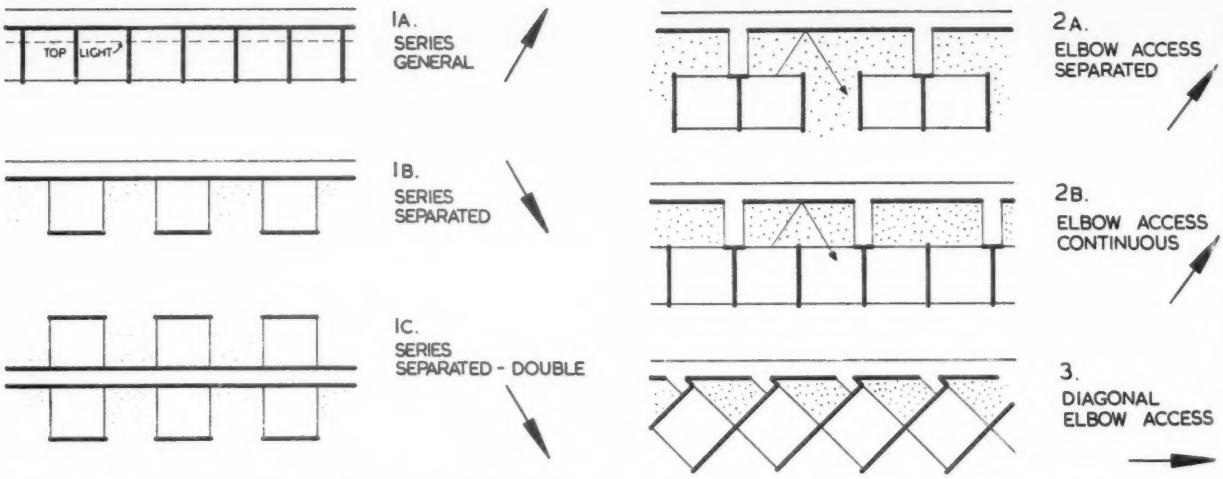


Diagram 3: Classroom plan types to obtain the required daylight factor

in schools and on the site, and largely overcomes the problems already mentioned in connection with the 8 ft. 3 in. grid. The circular gave two dimensions of span and left the choice of the bay width open. However, if such elements as standard windows and infilling panels are to be considered, it is necessary to fix the bay dimensions. An analysis of dimensions to spans shows that a bay width of 10 ft., with two spans of 21 ft. 4 in. and 24 ft. 9 in., are economical both in the use of structural members and in obtaining room areas approximating to those asked for under the Building Regulations, giving an average increase of approximately 3½ per cent. In the case of the most commonly repeated rooms the increase is as follows: for 480 sq. ft. and 520 sq. ft. classrooms, nil; the 600 sq. ft. classrooms become 602 sq. ft., or a 0.33 per cent increase, and the 960 sq. ft. practical rooms become 974 sq. ft., or a 1.45 per cent increase, the largest increases coming in those specialized rooms which occur only once or twice in a school.

Owing to the material shortages, it is important that more efficient structures be used than have been customary in the past. Light-framed structures are generally efficient provided that a suitable bay width of, say, 10 ft. is used. This type of structure is easy to erect, and facilitates the positioning of walls, windows, roofs and partitions, especially when these are prefabricated units, which can be very satisfactory if suitably constructed to the desired degree of weathering, noise, thermal insulation and appearance. If solid walling or blocks are used in the building, it is still an advantage to have a structural frame, as setting out is simplified and allowance is made for segregation of trades. As the structure carries the roof, it is also possible to get this on at an early date, so facilitating the erection of the remainder during inclement weather. In the case of two stories or more, a framed structure is essential, and it is even more important to use some form of light cladding-units on the upper floors, in order to reduce weight and so keep the size of the members down to the absolute minimum.

The most common structural materials available are steel and concrete, and the most usual types of frame in the past have been light, built-up steel roof trusses supported on steel stanchions, embedded in the foundations to resist wind, or, in the case of concrete, beams and slabs on piers.

The normal in situ concrete construction was becoming increasingly used before the war, but the time-lag and timber required for shuttering preclude its use today. Using traditional methods, we are left with the light built-up steel structure, which, whilst reasonably efficient in use of steel, does not lend itself to suitable cross-sections to achieve the desirable daylight intensity and uses the type of steel which at the moment is in very short supply, or concrete using some standard form of shuttering. A traditional variation of the steel construction is the post-and-beam structure. The common form of this is a pin-jointed riveted structure which does not take full advantage of the ability of steel to resist tension and compression equally, with the result that a disproportionately large amount of steel is used. The most efficient method is to weld the structure, making a rigid portal frame. These frames can be welded in the shop with site construction joints provided at the points of contraflexure where the bending stresses are at a minimum. In the case of a single-storey building of 25 ft. span with the frames 10 ft. apart with normal loadings, a steel joist beam riveted to joist stanchions will use 10½ cwt. of steel for each truss, whereas a welded frame will need only 6 cwt. This is even lower than the traditional pitched trusses and stanchions, which work out at about 6¾ cwt.

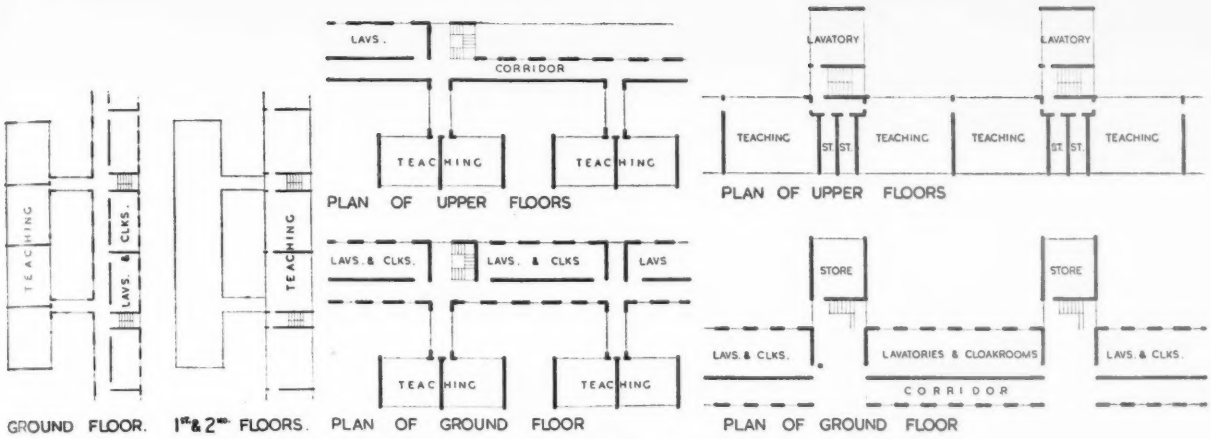
In the case of two-storey or multi-storey buildings, it is even more important to use a rigid frame. Whereas wind is negligible in a single-storey building, it becomes a serious factor in multi-storey work, and a riveted structure would have to be braced, thereby immobilizing the space inside, making it difficult to change the shapes of rooms should this become necessary.

Further economies in steel might be achieved by the use of built-up frames of pressed metal sections or light-gauge steel strip. This, used in the traditional way, would need as little as 5 cwt. of steel, but is unsatisfactory, first because the supply position is poor, and, secondly, because protective treatment against corrosion is essential.

A very low steel content can be achieved with the minimum use of strip steel by cold-rolling suitably shaped box-sections filled with concrete reinforced with pre-stressed steel rods. This method obviates the use of shuttering, as the box section is left in position and acts as part of the member. The typical frame would then need only 3.5 cwt. of steel, including reinforcement.

In concrete structures there are certain problems with standardized shuttering, and various precast elements are becoming increasingly used. There are, however, serious disadvantages when concrete is used for large structural members. First, concrete should, for economy of materials, be used monolithically, and this is difficult to achieve in precast work with site joints unless the whole frame is cast on the job flat, and hoisted vertically. Secondly, owing to handling, it is necessary to use more reinforcement, as the members are often hoisted and loaded contrary to the final design load.

Comparing the materials used with the various types of concrete frames on the 25 ft. span mentioned previously, cast in-situ frames use 32 cu. ft. of concrete and 4.25 cwt. of steel, the total weight being 46 cwt. Precast in three sections and jointed at the points of contraflexure, as with the welded steel frame 32 cu. ft. of concrete and 5.25 cwt. of steel are required, weighing 47 cwt. Precast post and beam, corresponding to the riveted steel structure, require 40 cu. ft. of concrete and 7 cwt. of steel, weighing 58.5 cwt., while with a precast frame in three sections using pre-



Diagrams 5 and 6: The elbow access plan on two or more floors

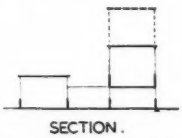


Diagram 4: Teaching rooms planned over lavatories

stressed reinforcement there is 27 cu. ft. of concrete and only 3.5 cwt. of high tensile steel. Comparing the welded R.S.J. frame, which has 6 cwt. of steel, with the precast concrete, which has 5.25 cwt. of steel, it can be seen that, contrary to the general conception, very little saving of steel is made by the use of concrete, while handling and transport costs are higher, as the concrete weighs nearly eight times as much, and is very liable to breakage. It is only in the case of pre-stressing that any appreciable saving in steel is achieved, this being 3.5 cwt. instead of 6 cwt. While this shows a saving in tonnage, there is no saving in cost, as this type of steel costs approximately 50 per cent more than the normal mild steel and is expensive to cast. It can be seen that the selection of material depends primarily on the type of steel available at the moment, and this emphasizes the importance of designing in the initial stage with a view to an interchange of material at a later date, should the material situation alter between the time of preparing the original drawings and the commencement of the work.

An alternative is the use of alloys, and it is interesting to compare costs and weights of material. A suitable type of structure used with aluminium alloys is the built-up strip. While the most economical weight of a frame in steel is 6 cwt. the weight of aluminium alloy used in this way would be 3.25 cwt. The costs of the raw material would be £6 for steel and £13 for the alloy, but the fabrication and transport costs will be approximately the same at, say, £7 per frame; thus the final costs would be approximately £12 and £20 respectively.

One other structural consideration that has to be faced in certain areas is that of mining subsidence. This can be overcome in two ways, first by considering sections of the structure as a monolithic whole, which, like a box, remains intact whatever the angle at which it is placed; secondly, by using a raft carrying a light structure, similar to fixing a series of objects on a tray. In the first case, the blocks can be separated by a small amount, forming little more than construction joints, the whole structure being strong enough to resist any lateral thrust should it lean on the adjoining buildings. The plan of such a building can be similar to that using normal construction, but its disadvantage lies in the uneconomical use of material. In the second method each raft has to be completely separated from the adjoining rafts by a distance that will allow one block to move without affecting the next, forming a series of blocks linked by light connections designed to crush if movement took place, and which could easily be replaced. The distance between each block for single-storey buildings would be about 4 ft. to 5 ft., while the size of the block depends on the economical size of the slab, which would be two, or at the most three, classrooms.'

Discussing the more purely architectural features, Mr. Clarke Hall considered the secondary school hall to be one of the most important links between the normal scholastic and the social education of the child. The hall should be equipped with a stage, equipped for concerts, music and dramatic art, both by the pupils themselves and by amateurs and professionals. It was also usable for outside functions, and in many cases as a social hall for the community. This meant that the hall should have a more permanent character than other sections of the school buildings, and should form the nucleus of the whole plan pattern. Such details as acoustics, furniture, fittings, lighting and colour should be considered with the greatest care. On certain occasions, such as speech days, the accommodation requirements were often more than doubled; this ought to be allowed for by a gallery, which he understood was not popular, or by some method whereby the entrance hall or other unit could be thrown into the main area by the use of sliding partitions.

He wished to finish by considering the æsthetic value of school buildings, though he knew it to be dangerous ground. Far more should always be taken into consideration than the mere interpretation of statutory regulations and structural requirements. Children had extremely receptive minds and thought mainly in the form of mental images which were greatly affected by environment. In order that these sense impressions might be trained in a regulated world of true values, educational needs had to be represented by true architectural forms in the school building. These needs must include all physical, mental, social and administrative requirements both of the child and the whole community. A school building which did not have its design based on these fundamentals would never be entirely satisfactory. This called for full collaboration between the architect and those responsible for general education and social development.

Contemporary architecture was only new inasmuch as it dealt with new needs, new materials and new conditions; the basic principles of approach to planning and proportion and use of materials were the same as in any great period of architecture. In the past the general development of architectural form had been gradual; today changes were evolved within each generation; moreover social and educational principles were subject to rapid developments and the requirements and expression of a school building thirty years ago could not satisfy either contemporary thought nor the new regulations.

The need to acquire knowledge was a part of the general free development of mind and body. There could be no real understanding unless there was a strong desire to learn. Conditions of work could be closely linked with those of play and so give the pupil a pleasant association with the school. He felt that individual education could be attained only in an open plan

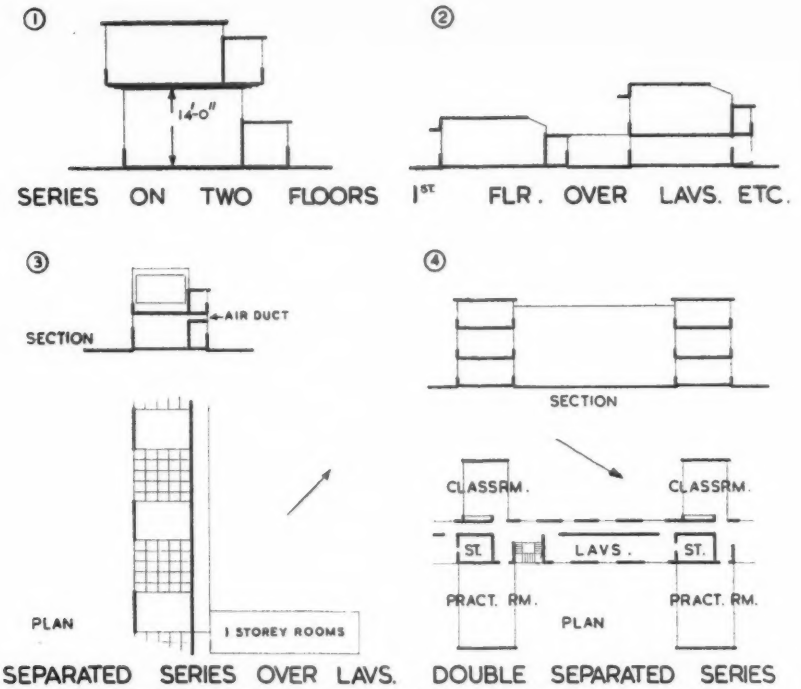


Diagram 7. Methods of obtaining the required daylight factor in multi-storey schools

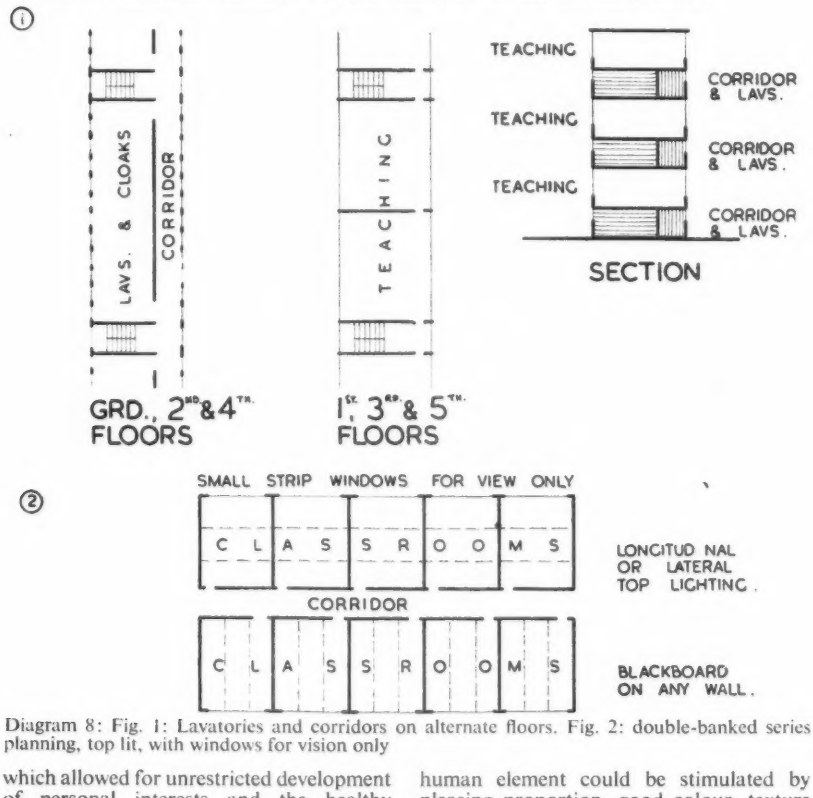


Diagram 8: Fig. 1: Lavatories and corridors on alternate floors. Fig. 2: double-banked series planning, top lit, with windows for vision only

which allowed for unrestricted development of personal interests and the healthy activity of the child; neatness and formal dignity need not be sacrificed, and the human element could be stimulated by pleasing proportion, good colour, texture and detail. This outlook applied not only to buildings but also to equipment and furniture which, if badly designed, could cause mental and physical numbness, bad circulation and eye strain. In these details, proportion and colour were as important as in the whole building.

On the question of colour, Mr. Clarke Hall said that the dreary chocolate so often used in the past was very depressing; the argument for its use that it did not show dirt led to its being practically never cleaned. A stimulating atmosphere was achieved in direct proportion to the lightness and clarity of the colours used. White and pure clean yellows, greens and blues were the most exciting, while an atmosphere of rest could be obtained by soft warm body colours such as grey-greens, blues, yellows or reds. Clear colours had to be applied to the right surfaces; clear yellow on a hard plaster gave a totally different effect from the same colour on a soft lime plaster. Few would feel at home in a living room which was completely surfaced with ivory glazed tiles and furnished with oilcloth curtains and painted steel furniture, but exactly the same colours in soft plaster, good textiles and wood allowed immediately for relaxation.

Corridors and cloakrooms should be very bright and cheerful, whereas classrooms should have stimulating light colours on a soft surface. Each room could have a different colour scheme to avoid monotony. Very pleasing effects could be obtained by treating one wall of each room in a different tone, the whole should be designed round some carefully designed scheme and not applied haphazardly.

Schools, like other buildings, must be related to their surroundings. In the past gardens provided by architects had often been spoilt by neglect. School gardens should be more than plots divided into regular rectangles; they should be naturally distributed round and even within the building.

Recently Mr. Clarke Hall had visited a school which he himself had designed seven years ago at Richmond, Yorkshire, in which the points mentioned had been incorporated. All the original decorations were still there and after seven years the white paint was spotless. The furniture had acquired a rich polished surface; young trees had flourished; the trellises were covered with creepers; the gardens were neat and trim. He had expressed his surprise to the headmistress, who told him that both the pupils and the staff took great pride in the building. Finally, she had said that the whole mental and physical bearing of the pupils had noticeably improved as the direct effect of the environment.

DISCUSSION

At the conclusion of the lecture, **Mr. Denis Clarke Hall** replied to a large number of questions. Asked whether it was preferable for craft rooms to be on the first floor and classrooms on the ground floor, so that paved areas could be conveniently arranged for open-air teaching, he pointed out that certain types of craft room were noisy and

might cause great disturbance underneath. A good deal depended on the extent to which teaching would be given in the open-air. If craft rooms were to be on the first floor, he suggested that they should be over lavatories or cloakrooms.

Replying to other questions on the subject of classrooms, he said that it was not difficult to preserve a balance between teaching areas on the one hand and storerooms, lavatories, cloakrooms, corridors and so on on the other, since each represented approximately one-third of the area of the school. Whether practical rooms were designed in blocks was largely a matter of physical planning. They tended to be designed in blocks for structural reasons, but he would recommend that workshops be kept entirely separate. Given proper ventilation, there should be no danger of undesirable smells if classrooms were placed over lavatories. He regarded natural ventilation as preferable to mechanical, but in certain rooms which were going to be used a great deal, such as the assembly hall, or where windows had to be blacked out for the projection of films or lantern slides, artificial ventilation might be desirable.

A number of questions dealt with the lighting of classrooms. Asked whether lighting from two sides of the room would not mean that half the class would have the major light falling on their desks from the right, and whether that was desirable, he said that the lighting in such a room was so even that almost no shadows were cast. Although the curve showed a variation of light, it was almost unnoticeable to the eye; and it was only when direct sunlight came in that shadows were cast. He agreed that lighting from two sides without obstruction from corridors was more expensive, but contended that the system had other advantages besides that of the actual lighting. He understood that the pavilion type of room was very good to teach in, and it made it very easy to control the ventilation, particularly in summer, because if the wind was blowing from one side all the windows on the other side could be opened.

Asked whether the daylight factor was the most important determining factor in planning, he said that it was one of the most important factors under the new regulations; he was not discussing whether those regulations were right or wrong. The south-east aspect for teaching rooms was recommended in the Memorandum and was usually looked for, but it was not in the Building Regulations. To the suggestion that it was not logical to allow 'false premises' on the importance of daylight to have so much importance in determining plan form, and that modern developments in artificial lighting had not been considered sufficiently, he replied that it might be wrong to over-emphasize the importance of daylight, but the regulations on the subject had to be carried out, and they certainly did affect the plan. He believed that in certain cases the Ministry had approved plans which did not give the 5 per cent daylight factor, but it must be remembered that the statutory requirement in the Building Regulations was 2 per cent. The Memorandum, which was not statutory, recommended 5 per cent.

There was only one way of excluding strong sunlight from classrooms, and that was by blinds of some sort, which were almost unobtainable at the moment. He thought that canopies should be provided over the windows whenever possible, particularly now that blinds were so difficult to obtain.

Asked whether the north aspect was still considered to be the best for art rooms, he said that if sufficient screening from the sun could be obtained he thought that the normal teaching area aspect should be retained. In a studio the object of a north light was to provide as even a light as possible for as long as possible during the day, to enable the artist to work for a long period; but in a school art room the normal period was 55 minutes or less, and the shadows and lighting effects would not change materially in that time. The advantages of obtaining sunlight, therefore, were more important.

He thought that very little open-air teaching took place in this country, mainly due to the trouble caused and time taken in moving the desks and so on. On this subject, however, a questioner with ten years' teaching experience in Middlesex and Kent suggested that much more open-air teaching could take place in the south if direct access was available from the classroom to the open air. Mr. Clarke Hall pointed out that that emphasized the importance of having classrooms on the ground floor.

Commenting on the suggestion that the standardization of school buildings which was taking place would tend to monotony, he pointed out that the standardization of certain parts of the building would not necessarily do so. Local surfacing materials could be used round a standard frame, which would be completely hidden. The plan pattern depended on the site conditions, and the final appearance depended on the details added to the building and to the way in which the exterior and interior were treated. Even if many standard parts were used, it would not necessarily lead to monotony, but if standardization were pushed to extremes it would do so.

Asked what was the maximum number of floors which was desirable for a multi-storey block, he said that he did not think that multi-storey schools were good, but they were dictated in some cases by the site conditions, and the size and site of the school determined how high it was necessary to go. On the question of whether the expense of in-cut and in-fill was justifiable to avoid the introduction of steps in the floor of the school, he observed that changes of level did not matter at all, so long as they were carefully designed, and architecturally a very pleasing appearance could be obtained by having various changes of level.

Mr. S. J. Marshall [*A*], Deputy County Architect, Hertfordshire County Council, said that most of those who worked on the problem of secondary schools found that their clients emphasized the great importance of obtaining a view from the classroom window—not a near view, but a long-distance view.

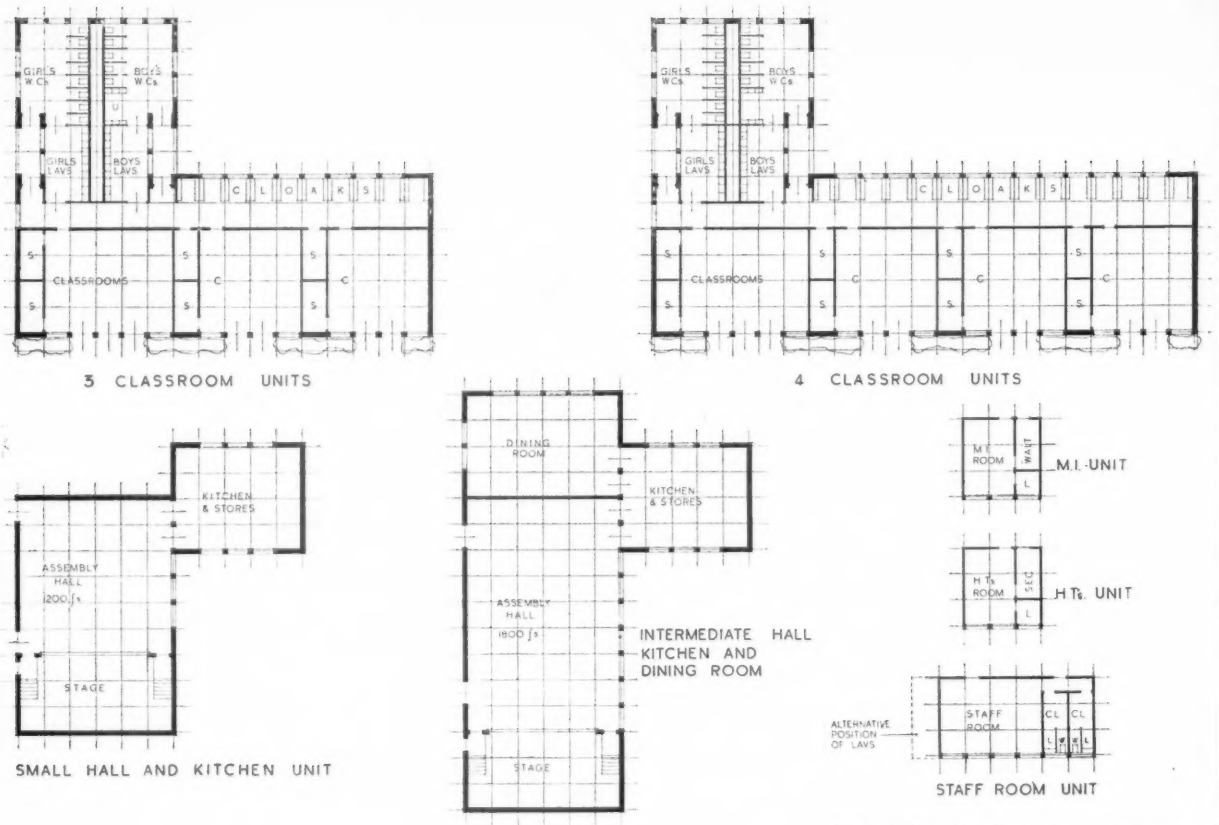
Mr. Clarke Hall seemed to suggest that it was often necessary to design a building without knowing precisely what materials were going to be used. In that connection, some reference might have been made to the Priority Branch of the Ministry of Education, because the time factor was very important. If one could see eighteen months ahead and be sure of receiving the materials which one wished to use at that time it was possible to design a building properly, but not otherwise.

Mr. Clarke Hall said he did not disagree with either of the points raised. The provision of a distant view was very important. Some of the plan forms which he had shown looked as though they did not provide it, but with the 'elbow axis' plan there were two views, one on a small internal court, which could with good treatment be very pleasant, and the other as distant as the site would permit. To relieve eye-strain the view should be as distant as possible.

He agreed that everything possible was being done by the Priority Branch of the Ministry, but there was an element of wishful thinking in visualizing the guarantee of materials in eighteen months' time. Unless the architect knew what he was designing in he could not design, but it was easier to foresee what surfacing materials would be available than to know, for instance, the type of steel which could be obtained, and it was possible to design for steel or concrete within certain over-all dimensions so as to make them interchangeable, and to design a block which could have either a steel frame or a concrete frame and be equally attractive with either.

Mr. G. A. Atkinson [*A*] pointed out that nothing had been said about the relation of the school plan to the site plan and the surroundings generally. He would like Mr. Clarke Hall to give his views on where the school should stand on the site, where the playing fields should be in relation to the surrounding residential areas and how the school should be related generally to the other social functions of the district.

Mr. Clarke Hall replied that, whatever views he might have about them, such matters were generally out of the architect's hands. Local authorities found suitable sites very difficult to obtain, and a compromise between the different requirements was usually necessary. Where possible the playing fields should be easily accessible from the school, the ideal being that the school should be on one part of the site looking towards the general direction of south-east, with the playing fields towards the north and placed so that they could be used without interfering with normal work in the school, so that they could be made available for general use.



Units of planning for primary schools referred to by Mr. John Harrison

Address by the Minister of Education

The Rt. Hon. George Tomlinson, M.P.

THE PRESIDENT said Mr. Tomlinson was always welcome at the Institute, and personally, as one who had been adopted by Lancashire, it always gave him great pleasure to welcome one who described himself as 'a Lancashire lad'. At the other end of the hall, Mr. Tomlinson would notice written up a quotation from the Leader of the Opposition—he would like to assure him that it had no political significance—'We shape our buildings, and afterwards our buildings shape us.' If there was any point on which the Minister could agree with his adversaries, he felt sure it would be that.

The Minister congratulated the R.I.B.A. on organizing the course, and remarked, 'Let me remove at once any feeling that there may have been that I might take amiss a quotation from the Leader of the Opposition. Anything that the Leader of the Opposition stands for which is in accordance with what I believe is, I think, based on common sense, and I wish that I had thought of the sentence which you have put up at the other end of this hall.'

They were at the beginning of a vast programme of building to meet the needs of primary, secondary and further education. It had been estimated that the cost of the programme would be of the order of £1,000,000,000 when all the development plans had been translated into buildings. They had today a new conception of education and of the needs of children, and were embarking on the vast undertaking at a time when not only had the war necessitated the use of new methods and materials but the present shortage of labour and materials compelled them to revise traditional ideas of building in many directions. It was of great importance, therefore, that all those concerned with the planning and construction of schools should have opportunities for discussion and opportunities for developing and spreading the many new ideas and techniques which must be adopted if they were to build schools which would both meet the problems of the present day and satisfy the needs of the future.

The Government's permanent building programme for 1947 and 1948 was estimated to cost about £50,000,000. It fell into two classes, the operational programme being the first. The estimated cost of this was £24,000,000, and it included 200 projects required for the raising of the school-leaving age, which were estimated to cost £11,000,000, and 235 projects required to meet new housing developments in 1947, the estimated cost of which was about £13,500,000. The short-term programme consisted at present of about 650 projects, estimated to cost over £25,000,000. It covered work to make good war damage, new schools to meet housing developments in 1948, and some provision to meet the increased birth rate. It also provided for some developments in the sphere of further education, with special emphasis on technical education and part-time day release, and it covered the essential minimum of work required for the training of teachers, and special schools for handicapped children.

The Minister continued: 'So far, we have received plans for 365 operational projects. Of these, we have approved 331, and 22 more have been returned to the local authorities for revision, so that only 12 out of the 365 are still at the Ministry. I wanted to say that! I have been at so many meetings where those figures have been reversed that I thought it just as well

that, while the position is what it is now, we should take credit for it!

'The fact that we have dealt with these problems does not mean that we have neglected what we describe as the short-term programme. Here, 87 cases have passed the stage of approval of final plans. In the first nine months of 1947, the Ministry approved plans for permanent building work costing just over £20,000,000. This rate of approval compares favourably, after allowance is made for the increase in cost, with the rate of approval in the year preceding the war, which was the most active pre-war year in school building.

'For the immediate future, I want to emphasize two main requirements in this matter of planning. First, we must press on with all speed with the outstanding operational cases; secondly, we must get through the preliminary planning stages of short-term projects as soon as possible. No preliminary plans have yet been received at the Ministry for almost half the projects in the short-term programme. This work must clearly be pushed forward if we are to be in a position to take advantage of it when labour and materials are available in the region. Unless we are ready when the materials are available they will be used by somebody else.

'Although in the first half of this year we did not get an actual start made on many large projects, progress in the last few months has been encouraging. At the end of July, only just over £5,250,000 worth of permanent building was under construction. I am speaking now only of projects costing more than £2,000. By the end of August, however, a further £4,000,000 worth of building had been begun, and I have no doubt that the figures for the end of September will show a further increase.

'We intend to continue the programme procedure which we have begun. When something is working well, I believe in allowing it to go on working until it ceases to be eminently effective. We hope shortly to establish a provisional programme for 1949. This programme will be based on three main requirements: (i) new houses, (ii) the rise in the birth-rate, and (iii) technical education. The aim is to give local education authorities and the Ministry a framework within which they can press ahead without waste of time and labour. The present situation does not permit us to go ahead with projects such as nursery schools and community centres at this stage. These are very desirable, and no one is more anxious that they should begin than I am, but in present circumstances they cannot normally be allowed to take up labour and material. By establishing, therefore, a sound programme on the lines which I have indicated we shall be able to concentrate our energies on projects which are of first importance.'

After reviewing the shortages of labour and materials, the Minister said it seemed to him quite clear that they were not going to be able to get through the huge programme of educational building which was required by the 1944 Act without far more use of standardization and prefabrication than they had made in the past. This was recommended in the Wood Committee's Report of 1943 on Standard Construction for Schools. That was why Ellen Wilkinson had appointed last November a technical working party to study the question further. It included two members nominated by the R.I.B.A. and two nominated by the County Architects' Society. He understood that the working party had made good progress, and hope to report early in 1948.

The Minister concluded: 'I want to bid you God-speed in your work, and to assure you of my sincere co-operation and the co-operation of my officers. Building is very difficult just now, as we all know; but I have tried to set our difficulties in some sort of proportion and to show you that, considering all the problems of the immediate post-war period, we need not be dissatisfied with what we have achieved in 1947. I am sure that in the next few years we shall continue to make good progress, provided that we all work as a team together and co-operate whole-heartedly in the interests of education.'

The President offered the Minister a hearty vote of thanks from the large gathering.

Nursery, Infant and Junior Schools

John Harrison [*A*], County Architect, Surrey C.C.

MR. HARRISON: I think it is necessary when designing schools to make a clear distinction between the primary and post-primary buildings. Many of the problems of construction, materials, engineering and site works will be common to all, but nevertheless there should and must be a separate approach to the design of schools for the younger and the very young children, if the buildings are to succeed in their purpose of housing a constant, cheerful and happy spirit, where the child will learn to live and work in harmony with others. There is a need, equally urgent to the nursery and infant teacher, for the nursery designer, and it is of note that the Consultative Committee on Infant and Nursery Schools said in their report that the design of ordinary infant schools was not in complete harmony with the prevailing opinion regarding its function and activities (page 161). Was that the fault of the architect or the educationalist? In any case, that was written in 1933, a long time ago in the light of intervening events, and perhaps at the present time it is opportune for us to re-examine the problem to see what progress can be made.

Age Groups. The primary schools are for the three age groups—nursery children from 2 to 5; the infant from 5 to 7; and the junior school for the children 7 to 11. From the little more than babe to the very often self-possessed young person ready and eager for transfer to the secondary school. It is a wide age range, and is wider possibly in mental and physical development than in measure of years.

The Consultative Committee on Infant and Nursery Schools in their report emphasized the importance of arranging the primary education, that is, from the beginning of school life to the age of eleven, as one continuous whole, and that there should not be any abrupt change, either in activities or courses and methods of instruction. Should this continuity be reflected in the building which, in the case of the nursery school, is a bridge between the home and school proper, and in the junior school (the upper part of primary education), the preparation for the formal work of the secondary school. The growth and development of the child will not be served by merely altering the size of the fittings and the spacings of hooks, and I am sure that in many ways the differences between the nursery and the junior schools will be expressed in the buildings.

The architect must examine the daily programme and routine of the schools and different age groups; he must know when class, group or individual training or teaching is given, and what difference in equipment and arrangement is required by the adoption of one or more of these methods. He must know when the floor ceases to be the toddlers play space, and when the teacher becomes the focal point of audible teaching. He must know what the teacher does and how he or she does it. He must be familiar with these and a host of other things if the school is to be something more than space for teaching.

Requirements of Education. The differences of functional requirements in the buildings for the three age groups can best be assessed by an examination of the daily routine.

In the nursery the first minutes are occupied by the superintendent and her helpers meeting the children and arranging for the removal and storing of outer clothing. In some cases the parents assist in this task. The next period is usually one of free activity—in the garden if possible. After that, a time for washing and hygiene. Next, a period of story-telling or singing. After this, a break for milk, and then activity with toys or climbing frames. After the mid-day meal there is a rest period of half to three-quarters of an hour on bed-stretchers. The afternoon is generally given to free activities. That is the nursery day, which is said to be 'food, rest and play'.

The infant school starts the day on a more formal note with an assembly, and the day is divided into periods, the longest of which are given to group and free activities, and the shortest to the tasks of concentration. Freedom is not entirely curbed, but the discipline of concentration

is being slowly imposed upon the child, although the room is still to a high degree an activity room.

The junior school sees the transition to formal education completed. It is a period of rapid mental and physical growth, and there is a great difference in outlook between the seven's and eleven's. The classroom becomes more and more a centre of teaching, with all eyes directed to the teacher. It is this which has determined the size and shape of rooms for some time. Simple dramatic presentations are given in the hall, and the children begin to take part in organized games.

The Child and the Building. It is quite obvious that the buildings and surrounding gardens will have a tremendous effect upon the mind of the child, and this during the years when every endeavour is being made to stimulate the imagination. Every part of the building, every particle of the environment of the child will exert some influence, whether good or bad, and it is part of the architect's problem to provide an atmosphere of freedom. I do not think one can emphasize too much that the primary school should be intimate and domestic in character, with no overbearing scale or motifs.

It has been said that school design is a little of the hospital, a little of the office, and a good deal of the institution—possibly unkind criticism, but deserved in many cases, and something to avoid at any cost, for, if the primary aim of education is to provide the most favourable conditions for growth—of body as well as mind—then the buildings must display the twin qualities of lightness and grace, and the children's awakening sense of beauty should not be stunted by a formidable and oppressive environment. It has been said that the worst indictment of the old and overcrowded schools is not on physical, but on psychological grounds, and it is, indeed, quite possible that there is a strong connection between the fears of childhood and the nervous troubles of later life.

Sites. The intimate character of the primary school buildings should make them good neighbourhood units, ready to fit quietly into the pattern of the community, and interest and aspect should be the dominant features of the site, rather than regularity and size. Indeed, the nursery and the infants might with advantage be housed on sites which are irregular in shape and do not possess a maximum road frontage, providing it is possible to build a garden playground which will have sun, leafy-shade, and seclusion. It is these surroundings which are wanted for children who will be in the open air whenever possible.

The garden must largely give way to the playing field within the junior schools. The children are still very young, and the pitches on which they will play their first organized games should be reasonably level, but whatever the age of the children it is well to remember when developing the site that the grounds will be used for rest as well as recreation.

The Requirements of Health and Hygiene. Physical well-being is an important aspect of all school life, and undoubtedly the emphasis is strongest at the nursery and infant stage. From the first there must be provision for every child to be medically examined. The Building Regulations require a separate medical inspection room only in the nursery schools and in the schools of over 300 children. In my own area at least there is a strong demand for separate inspection rooms, which can also be used as sick bays, for all schools, and I feel that this limiting figure of 300 might be reconsidered by the Ministry of Education. At present a routine medical inspection is made on every child in day nurseries and nursery schools three times in every year, and there is, in addition, an annual dental inspection, and every child is examined on admission to a primary school, and then again at the age of eight years, and again in the last year at a primary school.

The struggle against disease will influence the design of the buildings in the need for adequate ventilation, provision of sufficient cubic space, the requirements of hygiene and the proper use of internal finishing materials.

The study of physical well-being has also developed the school meals service beyond recognition in the past few years, and here again I find the Minister's distinction between the schools which are to have dining-rooms (seven classes and over), and those which are not to have them, very unpopular. This was the first, and is still the most frequent and violent, criticism on accommodation I hear.

These basic requirements of well-being are for the development of the normal child; the children in need of separate care and remedial treatment will be at special schools, which will have their separate problems of planning and design.

The Problem. This analysis shows that the problem is two-fold—educational and medical. To provide buildings of the requisite space for training or teaching, equipped for the special needs of the age group, and to give in the buildings the best possible conditions of light, warmth, and a free movement of air. To avoid the 'hard' atmosphere, and yet to take every care against infection, and to arrange the buildings in their surroundings so that the result is a composition of simplicity and freedom, which will get the affection of the child and the appreciation of the parent.

The teaching units are the classrooms and the hall. The nursery room is used for all purposes—work, play, eating and rest. As there is no formal teaching the shape and arrangement is not governed by light access and a fixed teaching position, and the standard equipment is toy cupboards with some open shelves, and possibly a sink with a small work bench attached. It is not until the higher age groups of the primaries that the fixed blackboard becomes a necessity. Proper provision must be made for the display of the children's work in all but the nursery rooms. If this is not done the result is an untidy straggle of silhouettes and other objects on the four walls.

The importance of the hall obviously increases in direct ratio with the age of the child. For the nurseries a hall would be valueless. In the infant group it is the scene of their noisier indoor games or their first essay into physical drill. A platform, rather than a stage, should be provided. With the juniors the hall becomes more and more the formal centre of school life, and the platform must be enlarged to a reasonable stage. The hall becomes something more than an enlarged playroom, and the children are taught to use the stage with their simple presentations, and, what is equally important, learn to appreciate the controlled actions of others.

The administration and staff rooms, which grow in numbers with each review of accommodation, require privacy, and yet have to be easy of access from the main entrance.

Washing and lavatory rooms should be near the teaching rooms, and should be dispersed rather than concentrated, and for the very young should be roomy and with an easy circulation. The fittings should be of the simplest design, and well able to withstand every form of careless and mischievous use. The nursery school cloakroom will have the trolley rack for towels and toothbrush, but proper provision must also be made in the other departments for adequate towel space and other requisites.

I have referred to the need for adequate ventilation as an essential health requirement. I find difficulty, however, in designing an economic heating unit which will permit the required six changes of air every hour when the outside temperature is very low, without causing draught, and I suggest that six changes of air should be obtained down to 42 degrees F. outside temperature, and below that three changes only. To make possible these air changes in comfortable conditions, having in mind the other basic requirements of classroom design—unusual window area, and clear floor space—will call for a well-designed system of heating.

There are two simple but important points to remember in regard to lighting. Firstly, that most of our learning is obtained through the eyes, and, secondly, that the eyes during early childhood—owing to their rapid growth—are particularly susceptible to injury. The problem is, therefore, to provide the correct aid to normal, but possibly overburdened vision, and to make the process of 'seeing' easy and comfortable.

The control or reduction of noise is another problem of importance, for while the rejection of sites subject to high noise levels is very desirable, circumstances will not always permit of this, particularly in urban areas, and we might remember that comfortable conditions of light and air can easily be upset in the endeavour to shut out intruding noise.

It is the practice of the Surrey County Council, which I serve, to consult with representative teachers and others concerned, upon the accommodation to be provided in the schools, and I find a

unanimous demand, apart from dining halls in all schools, for a waiting room within the building, a parents' shelter at the nursery and infant schools, more accommodation for school helpers, and a resident caretaker.

Finally, in this elaboration of the problem, I might refer to an essay on the ideal school from some 'metropolitan' Surrey children. I found in these an overwhelming desire that everyone be allowed to bring his or her own bicycle to school, and that all windows should be glazed with 'perspex'. This appears absolute evidence of existing suppression. There is a curious—almost snobbish—wish for quadrangles, and dining halls are regarded as being absolutely essential. There is one young man who says the schools of today are of no use to the children—for the ventilation is bad and the lighting casts shadows. He wants individual desk lighting, elevators and a roof garden, and if these are provided and the buildings limited to three storeys he is sure children will be more encouraged to attend.

The Solution. The first factor I examined in my attempt to find a solution to this problem in planning was the size of the infant and junior schools required under the development plan. The sizes, of course, ranged from the one-class school, of which there were nine only, to three-form entry junior schools, but far the greater number of schools lay between the three classrooms and nine classrooms size; the most common being the six-class school. It seemed, therefore, that the unit of planning might well be three classrooms, and that the planning of the cloakroom and sanitary accommodation as part of the unit should be examined. The smaller schools in size and number of one and two classrooms could well be ignored and treated as special cases; and for the larger schools the classrooms of which were not in multiples of three, the sanitary annexe could be slightly enlarged to serve a unit of four classrooms.

The components of this unit—classrooms, storerooms, cloakrooms and lavatories—might well be considered the 'constants' of the problem; the variables being the hall, dining-room, kitchen and administrative rooms, which appeared or increased in size with the increase in number of children, but not necessarily in direct proportion with that increase. If dining-rooms are not permitted in the smaller schools, and there is always with us the possibility of extension or growth, there should obviously be a close relationship in the planning of the hall, kitchen and dining-room, and that seemed to decide the next point of planning; the siting of the kitchen to serve hall or dining-room or both.

The spatial unit had then to be settled, and after trial in planning, and consideration of other units of size which have been used, a 6 ft. spatial unit was decided upon—a 6 ft. spatial unit which is used as a 12 ft. constructional unit, particularly as regards the steel frame. The remaining rooms which are the small units of administration are readily used in their proper combination, as filling-in pieces between the major elements (see p. 14).

I would like to describe in a little more detail the planning of the classroom group. In both the three and four room units there is one room of 700 sq. ft., and opposite this larger room is planned the sanitary unit. Between the classrooms there is a sound buffer of store and drying room, and the continuous cloak alcoves are planned as part of the corridor, isolated from the traffic route by low glass screens. The fittings for hats, coats and shoes are of simple free-standing design, in lightweight metal, with mesh divisions and lockers, with hardwood seats.

In the classrooms the two side windows of the main bank have a cill at desk-top level which is carried around all walls as a display shelf, and elaborated into tiers at either side of the blackboard fitting.

The main south-east classroom windows are in four panels—the two centre panels being used as opening doors, and the right and left panels finishing at cill or desk-top level, for it was found very necessary to have this external wall surface available for the housing of heating units.

The sanitary annexe is divided centrally by a 3 ft. passage, and all lavatory basins and W.C's. are fixed, either to or near the face of the two walls of the passage. All services are brought to this passage from the main duct in the classroom corridor, and from the passage the services are taken to each fitting, and all waste from the fittings is discharged into cast iron drain units laid on—not under—the floor of the passage. The passage is warmed, so there should be no freezing of water in the fittings.

Daylight. There is little or no difficulty in obtaining the standard of daylighting required by the regulations in a single-storey building, but there is an inevitable wide margin between the maximum and minimum values in the same room on the lower floors of a multi-storey building. The floor to ceiling height decided upon for the single-storey primary school is 11 ft. 3 in., and in each room, apart from the main south-east window, there is a clerestory window and a north top light. The maximum daylight value, using for measurement the Daylight Factor Protractors introduced by the Building Research Station, and measured on a line taken 8 ft. from the blackboard surface on a 2 ft. working plane is 15.00; on the same line the minimum value is 8.50. In the ground floor classrooms of a multi-storey school, with a ceiling height of 11 ft. 9 in., the same readings are 12.54 and 2.36. Even if the ceiling height were substantially increased above 11 ft. 9 in., it would be impossible to get the same readings as the single-storey room as it is planned. The separation of the classroom block from the corridor and cloakrooms by means of light courts gave maximum and minimum readings of 12.75 and 6.15.

The attainment of satisfactory daylight factors alone, however, will not completely meet the case for good lighting, for intensity of light is not necessarily an adequate measure of seeing comfort. The twin enemies are gloom and glare, and the brightness contrasts within the room, which are frequently well over 100–1, must be minimized. This will mean a general use of light pastel colours for rooms and furniture. We should aim at interiors giving 70 per cent ceiling reflectivity, 60 per cent wall, and 35 per cent reflectivity from desks and floors. The blackboard surface has only a reflective value of approximately .5 per cent, so care must be taken to keep this to the effective minimum in size.

The struggle to lift the maximum values of lighting does, and perhaps, inevitably, raise the value near the main bank of windows to such a degree that there is the nuisance of excess solar light. This is being counteracted by providing external glare screens—a hood at transome level, with side cheeks diminishing to zero at the feet.

Another approach to the provision of really good classroom lighting may be the use of prismatic glass block, in what the Americans call the glass block and vision strip construction, and no doubt we will hear and see more of this in the future.

Artificial Light. The number of hours for which artificial lighting will be required in a primary school will probably not exceed two hundred a year, but that should not be any reason why the installation should not be properly designed. The standard required, 10-15 foot candles, can be readily obtained, and the bone of contention will be whether tungsten lamps or high voltage hot or cold cathode tubes should be used. I have no doubt that the tungsten lamp will be with us for many years yet, but obviously cathode fluorescent tubes have many advantages, particularly as a means of supplementing daylight and in giving a surface of comparatively low brilliance. Blending artificial light with daylight by the use of an automatic switch control actuated by falling light values deserves serious consideration, and this would suggest that light values both for daylight and artificial light should be assessed or expressed in foot candles.

I have referred to the low reflectivity of the blackboard and it is necessary to provide special lighting to the board to ensure that the vertical illumination of the board is equal to the horizontal illumination of the desks. This lighting fitting must be totally screened from the pupils.

Heating. The heat losses in a school building, and particularly the primary school, are higher than in most types of buildings, and even if one does not accept the six air changes per hour in all conditions, the losses amount to 4.6 B.T.U's. per cubic foot, as compared with an average of 3 B.T.U's. per foot for normal buildings, and to this add that the young children themselves suffer a proportionately greater heat loss from the body than an adult, then one will understand why heating is much in the mind of those who are responsible for the buildings.

When designing this school I resolved that the wall and floor surfaces should be

free of all heating units; that, together with the type of building construction to be used, in effect determined the system to be used. Proved systems, such as complete underfloor heating and lightweight coil panels, were abandoned, either because of special construction or materials required, and while electrically heated panels in either walls or ceilings offered attractive possibilities, particularly as regards the elimination of the boiler room and chimney stack, the general question of running costs, and the many exhortations to save electrical energy, particularly at peak load times, weighed the balance against this method of heating.

The familiar low pressure hot water system was therefore adopted, using cast iron radiant panels (rayrads) as a continuous dado for the heating surface. The rayrads are part of the inner wall surface, and extend from skirting to cill. The cold down-draught from the main bank of windows is counteracted by the use of electric panels in the underside of the window heads. A unit of underfloor heating will be used near the main bank of windows in the central hall. This scheme, of course, takes advantage of the Building Regulations, which permit a lower temperature by 5 degrees F. than with convector heating, and this should mean a saving of 15 per cent in fuel.

Construction. The present shortage of materials meant abandoning any constructional design based on particular materials, particularly if time of erection is to be considered of any importance. One must be prepared to substitute materials and forms of infilling as time passes. By dealing with the irregularities of the site by means of a light concrete raft and piers, the steel frame can be fairly easily standardized, and has been adopted in this single-storey school to obtain the advantages of rapid roofing in.

It was originally designed to fix the windows direct to the stanchions and posts, but the difficulties of obtaining the pressed steel cover moulds has led to a modification at this point.

The external cladding, for the first schools at least, will be 4½ in. brickwork, clipped to the steel framework, and all internal cladding will be wood wool panels, with the exception of the heated lower wall surface.

By this method of planning full advantage can be taken of prefabrication in the construction of ceilings, stores and shelving, and the sanitary unit, including the drainage.

I do not think, in fact I am sure I will not, find the final solution to this particular problem of design. But what I am trying to do is to build the school we so urgently need, in the shortest time possible, and at the same time create buildings which will make some contribution to the architectural amenities of the neighbourhood. The almost complete standardization of accommodation, particularly in the primary schools, produces marked repetitive units which can be standardized in planning and in construction, and then grouped in the numbers required in the form best suited to the physical characteristics of the site and the architectural demands of the neighbourhood. The cold hand of standard practice—feared by so many—need not obliterate the beauty in buildings planned on these lines, individuality can still be obtained—by careful grouping, by the use of different materials, and by the development of the site with gardens and trees.

Remodellings. I cannot conclude this paper without referring in general terms to the remodelling of the existing schools. The economic position may well mean that pressure will be applied to bring quite a number of these buildings, which one hoped would have been abandoned, ultimately within the development plans.

The replanning of a school, as compared with a new design, more often than not calls for more ingenuity of mind and always an equal architectural ability, but in many cases, with the best will in the world, the existing buildings and site cannot be moulded to fit the new regulations. Often the site is too restricted to allow for enlargement, the buildings may be in a bad structural condition, or the rooms are sub-normal in size, and hygienic conditions deplorable, and the arrangement of the plan is such that the rooms cannot be economically enlarged or improved.

The question of enlargement is the stiffest hurdle to overcome if we assume, as we must in the absence of any other ruling, that the building regulations will have to be substantially complied with. How difficult this problem is can be seen by considering the increase in the floor area of schools in the past seventy years or so. There are 374 primary schools within the county I serve, and I find that the schools built before 1902—213 of them—had a floor area equal to approximately 12.75 sq. ft. per child. In the schools built up to 1912 the floor area for each child was 15.00 sq. ft.; a change of planning between 1912 and 1914 increased the floor area to 18.50 sq. ft. per child, and between 1918 and 1937 the floor area rose to 22.13. Between 1937 and 1939 the schools were built to what might be called the Grey Book standard, and have a floor area of 31.50 sq. ft. for each child. The floor area of the post-war primary school will be about 60 ft. per child. This huge increase in floor area is only in a minor way attributable to enlarged teaching rooms. In the pre-1902 schools the ratio of classroom to corridor was 9-1, in the new schools it might be 1½ to 1. I am not pleading for a return to passage rooms, but stressing what we all know, that the regulations are exceedingly difficult to implement in the case of the older school buildings, and it is difficult for many who are not architects to understand or appreciate why buildings of comparatively recent construction and of some local pride, are now classed as being unsuitable for development for the purpose for which they were built.

I said at the beginning this problem was twofold—to meet the educational and the health needs, and, of course, it has two aspects—the old buildings and the new schemes. The common problem and, indeed, common to all building, is how to overcome in even some small way the shortage of labour and materials. I am sure good design will prove economical in the use of materials, and careful organization within the office can reduce the number of man hours at the site.

We will succeed with our new schools by a comprehension of the problem and having the courage to apply the results of architectural and scientific research, when we might fail by too great a reliance upon the principles of tradition only, and, perhaps, a nostalgic longing for individuality.

DISCUSSION

Replying to questions, Mr. Harrison said he felt that there was merit in prefabrication in small doses, but owing to the different conditions in different parts of the country a system of prefabrication was unlikely to become generally adopted throughout the whole country unless a design of outstanding merit was produced. He imagined that any authority which had a scheme of prefabrication would willingly make it available to recognised bodies in the area, such as voluntary schools. Asked whether consideration should be given to the possibility of a reduction in the numbers in classes which might come about within fifteen years, he replied that the chairman of his committee was convinced that that would happen. It could be met if one could achieve a very high degree of prefabrication. Ideally one should almost be able to put up a school with a screwdriver, but at present one could not entirely eliminate wet construction.

He was not in favour of having schools of all types in one group; the most successful school was one which kept as nearly as possible to one age group. Asked what was the objection, if they were self-contained, to having secondary and primary schools on the same site, with common user of kitchens and assembly hall, he said that in many cases in closely built-up areas it was necessary to have three or four schools on the same site, but on the whole that was not a good plan. There were different head teachers, and with the best will in the world it was difficult to have an assembly hall common to two schools. He would prefer to have as far as possible each school on its own separate site; where that was not possible he tried to arrange for the maximum separation, with individual access from different roads.

In his view, it was not advisable to combine a welfare unit and clinic with a nursery school, though that was really a medical and educational matter. The superintendent of the nursery school would want the children brought and left there, whereas at the clinic there would be a continuous business of interviewing parents and others throughout the day.

Whether it was sound practice to design and use schools for youth purposes and young people's clubs was a matter for the education authority, but his own view as an architect was that the school ought to be kept for one age group. If the buildings were used for all sorts of purposes it would be very difficult to keep them clean, and they were apt to be badly treated.

Where a room in a junior school had been adapted for a nursery class a separate kitchen was not provided, but he thought that any new nursery classes should have their own separate kitchenette. He felt strongly that in nursery units catering for children of 5 to 7 separation of the sexes should apply in the sanitary block.

On the question of the cost of schools per place, he said that the cost would approach £200 a head in a completed school, but that was partly due to the need to undertake the operation in two portions, involving the need for temporary boiler rooms and so on. If it were possible to build the complete school in one operation he thought that the cost would be substantially less. At present he was finding for the first time that the bigger the project the higher the price. That was due to the fact that the longer a job lasted the more the unforeseeable risks that the builder had to face. He did not think that any costs which one could talk about today would be permanent.

Asked what material was likely to give a 35 per cent reflectivity value for floors, he agreed that that was a difficulty, and said that for the time being it might be necessary to waive that requirement. To prevent young children from breaking or cracking glass doors, he strongly advised, from bitter experience, that the lower panels of doors should be of toughened (armourplate) glass.

There were three types of surface for paved playgrounds: (i) concrete, either pre-cast slabs or in-situ concrete; (ii) tarred limestone or slag, and (iii) some form of sand carpet. Concrete was troublesome in wet weather, or with a rapid frost after fog or rain and was liable to cracking and settlement. There was very little to choose between tarred limestone or slag and some of the sand carpet treatments, but he thought that tarred limestone or slag could be more rapidly repaired.

A number of questions was asked about the plan by which cloakrooms formed part of the corridors. Mr. Harrison said that in his view the cloakrooms must be as near the classroom as possible, and no difficulty arose when the corridor was doubled in size and cloakroom alcoves provided which were separated from the main stream of traffic by glass screens, forming in effect a continuous cloakroom. The arrangement made control easier; the corridor cloakroom, being opposite the classroom, was under better control by the individual teacher. The screens were necessary because cloakrooms were somewhat untidy, and the general view down the corridor was improved by the presence of the screens.

Asked how it was possible to arrange that towels were not in contact with one another, which was one of the Ministry's requirements, he said his committee had decided to try paper towel rollers, which would give each child requiring one a fresh paper towel. They proposed to try hot air driers to obviate the use of towels, but he understood that medical opinion tended to be against the method; there was some obscure reaction on the skin. Fountain or circular washing troughs were popular for industrial use, but for school use there was no saving in space, and there would be a tendency to 'fun and games' among the children.

He would prefer to have a sanitary unit serving a three-classroom group rather than a large unit serving a large number of rooms. He had adopted the unit of three classrooms because it had many advantages. The smaller sanitary units complied with the Ministry's requirement of being accessible to the playground; there was direct access.

On the question of whether infant classrooms should be planned as self-contained units, he said that in the average small primary school one wing was the infant wing and the opposite wing the junior wing. There might be three or four classrooms for infants and six or seven for juniors, and they could be separated by the administrative rooms and the hall. For infant and nursery schools there was a demand for sand pits, but not so much, he thought, for paddling pools. The nursery school was a very expensive unit, requiring over 100 ft. of floor area per head in new schools, but for groups of forty it could be done in a range of about 140 ft. It should be treated very much as a domestic building, the height of the two nursery rooms being brought down below 11 ft. to about 9 ft. 6 in. or 10 ft., to get an outside treatment which was as like that of a good house as possible.

Asked whether changes of level in corridors should if possible be avoided in junior schools, he expressed agreement with what Mr. Clarke Hall had said on that subject earlier; if properly provided for they were not at all dangerous. With unit planning he suggested that a unit should be on one level. He did not object to the use of ramps, but they usually took up more room than steps. At door openings a ramp was obviously preferable to a stair for a small alteration in level.

There was no objection to the movable blackboard in the primary school if it was properly placed, but there was a case with the higher age-groups for the fixed rather than the movable blackboard. The easel board might be used in the craft room and for the younger infants.

Where open-air teaching took place, in some schools which he had put up the classes were separated by flower-boxes at right-angles to the classrooms, and he thought that that was the best way to do it. The flower-boxes could come to look very ugly if the school personnel did not keep them in good condition. They made provision for outdoor teaching by means of paved areas outside the main bank of classrooms and almost equal to the width of the classroom, but there were not many days in an English summer when teaching could be carried on out-of-doors. The recent summer had been exceptional.

Mr. W. T. Benslyn [*F*] said he had greatly enjoyed Mr. Harrison's excellent paper, and had been very pleased to hear the figures given by the Minister of Education for the operational programme. He had been very much impressed by the wonderful way in which the Ministry had got on with the job, and had himself received very great help from the Regional Priority Officer and from all the officers of the Ministry. The code of practice to accompany the Act of 1944 had been got out very quickly, and it was flexible and permitted a great deal of variety of planning, while at the same time giving helpful guidance on matters of detail. He hoped that the teamwork between the Ministry and the local authorities would be continued and expanded.

Miss M. B. Crowley [*A*] (Architect's Department, Herts C.C.) suggested that there were questions which ought to be discussed apart from the aspects of school design covered in the two excellent lectures given that day. She thought they were a little too complacent and too inclined to think in watertight compartments. The Education Act of 1944 called for a new approach from architects as well as from educationists; were they thinking enough about how that could be put into effect?

The questions of the site plan in relation to the community and of health centres and community centres in relation to school buildings had been regarded as slightly out of their province. A new approach was needed, and the present meeting should afford an opportunity to discuss how the architect could work as an integral part of a whole, and not just as dealing with the isolated fragments of a jigsaw puzzle. That meant that the architect had to be part of a team which included not only other experts but educationists and health experts. Were architects working out the best way to implement the full implications of the new Education Act?

Mr. Johnson Blackett [*F*] said he had had some experience in the last two years of prefabrication, and erection usually seemed to take much longer than with the traditional house. Now that bricks were in very good supply he thought that a more normal method of construction should provide schools quicker than did prefabrication. He had been interested to hear Mr. Harrison say that he was wiring 4½-in. brickwork to his stanchions and covering the inner side with wood-wool slabs. Personally, he thought that driving rain might cause trouble. Also he would also like to know Mr. Harrison's views on the plenum system for school heating.

Mr. Harrison, in reply, said that he himself was using bricks. So long as prefabrication was used simply for the bones of the structure different forms of infilling could be

devised, and in that way it was possible to get variety and make use of traditional materials.

With the construction he had described it should be borne in mind that one could have a much wider cavity. The brickwork was not clipped to the wood-wool slabs but to the stanchions. It had been necessary to design a new wall-tie, but that was typical of the new terms in which one had to think today.

He had considered the plenum system, because he felt that the only way of giving the Ministry of Education the number of changes of air per hour which they wanted —if one was going to *measure* them, which was quite different from assuming that one had got them—was to shut all the windows and use the full plenum system; but in a primary school that would be entirely wrong, because they had to teach the children decent ordinary living and that a window was meant to be opened for ventilation. He had examined several schemes for using hot air, but was not satisfied that he could get the effects that he wanted without completely shutting up the school.

Standards and Quality of Lighting in Schools:

W. A. Allen, B.Arch. [*A*]

At this point in the proceedings, Mr. H. S. Goodhart-Rendel, Past-President, occupied the Chair in place of the President.

THE BUILDING REGULATIONS issued under the 1944 Education Act prescribe for classrooms standards of artificial lighting which are unexceptional and as such require no particular discussion at the moment. But the standard of daylighting arouses interest among designers because it is bound to affect the design of windows, which are important elements in the vernacular of architecture.

Quite naturally, the more rigorous the standard the more severe are the conditions it imposes upon the design of windows, and this particular standard of daylighting is high enough in the circumstances to demand sometimes a certain ingenuity on the part of the designer. We note 'in the circumstances' because the standard is made rigorous not so much by the amount of light it denotes as by the fact that the room which is to be lighted is, relatively speaking, very large. So far as actual intensities are concerned, the 2 per cent daylight factor which is required represents no more, and probably not as much light as any person would normally choose to have for his own reading near a window. If we want, we can estimate fairly accurately just what it means in terms of light in relatively unpolluted atmospheres in this country. For over a month of each year it represents a maximum value of about 10 ft. candles during the school day, and this would be the prevailing value for a total of about two months, during which the maximum would only be about 15 ft. candles. For somewhere between four and six months the prevailing values would be of the order of 20 ft. candles. In the rest of the year they are higher, but if we compare all the values mentioned with the figure of 10 ft. candles required for artificial lighting in classrooms, or more particularly with the values recommended for ordinary industrial purposes, we will see that the standard for classrooms is at best modest. Yet it may be exacting in design, and any standard which is exacting must receive careful study until a good tradition is established.

The chief viewpoint from which it has to be watched is, of course, that of children's vision, which it is intended to protect. At the time when it was first proposed some four years ago, the medical evidence concerning school children's eyesight was such as to give rise to concern, but was not available in any detail. There was known to be a steady and serious deterioration during school life, but the causes of most of the eye troubles were not fully understood, especially in respect of the contribution which good lighting might make to their relief. The Building Research Board's Post-War Study Committee on the Lighting of Buildings, in recording this, said that the high incidence of eye troubles among children, together with the social importance of good eyesight made it desirable to take any reasonable steps which would improve matters, and their recommendations for classroom lighting were framed accordingly. At the same time they noted the desirability of conducting further investigations as soon as circumstances permitted. This was kept in mind by the Building Research Board, and shortly after the war a Joint Committee of the Medical Research Council and the Building Research Board was set up to deal with general problems of lighting and vision. The Committee has taken up actively the question of school children's eyesight, and in the absence of any other important contributions to knowledge on this problem it would seem desirable to leave the matter as it stands until the Committee reports.

There is, however, another important aspect of lighting which is of interest in relation to the prescribed standard and which has had no public discussion among architects in this country. Generally it is described as a study of brightness ratios, and it relates to the brightnesses and contrasts which ordinarily occur in the field of vision, especially indoors. It is important because it has a great deal of influence upon the efficiency and comfort of vision, and it intimately affects architectural design. We are late in this country in coming to grips with it, and it is proposed to devote the remainder of this paper to it.

Some fundamental characteristics of vision. Two characteristics of vision lie at the root of the matter:

1. *Our eyes tend automatically to direct themselves to the brightest thing in any view and to focus on a contrast.*
2. *Our comfort and our ability to see are impaired by glare.*

The first of these largely determines the amount of attention which we will give to any particular object or activity in the field of view. If the object of attention is bright and contrasty we will usually have no difficulty in maintaining our interest in it; on the other hand, if something else—commonly the source of light—is brighter and more contrasty, then it will automatically tend to draw our attention, and an increasing effort of will-power and an increasing interest in the object will be necessary as this tendency to distract our attention is increased. School children and school teachers would be entirely exceptional if they could avoid reductions—often substantial—of learning facility and teaching ability under many common conditions of distraction caused by improper lighting; and in any case they could not avoid an expenditure of energy in the attempt to do so.

The other characteristic concerns glare, and the adverse effect it has on our ability to see. Every observant person knows about this from common experience. You will sit sometimes near a window with a generous view of sky in your eyes, and in a moment or two be drawn to shield them with your hand—whereupon there is at once a feeling of relief and increased comfort, accompanied by the impression that the illumination inside the room has somehow been improved. The effect can be quite surprisingly sharp, often very striking. Translate this to a fixed desk in a school classroom and let the effect persist for a whole day—indeed for weeks and months with all kinds of skies, and in all kinds of artificial lights, and you will have some measure of what this means to children at school.

Although everyone has experience of glare in this sense, it is not at all well understood. For example, you will often hear someone say that 'there is so much light in the room that it's glaring'. Indeed, this has been said in criticism of the prescribed daylight standard for classrooms, that it represents so much light as to cause glare. In fact, indoors, this sensation can be experienced almost only when there are dark as well as very bright areas in the field of view also, for glare is chiefly a matter of contrast in one form or another. Broadly speaking the greater the difference in the brightnesses of various parts of the view, the closer the contrasting patches lie, the greater the areas of either, and the lower the general illumination (apart from the source), the sharper will be the sensation and the greater its adverse effect upon our ability to see.

We can now take the argument a stage further, for out of our two characteristics of vision we can deduce three important rules for design:

Fig. 1: A window partly treated with bars of type A in Fig. 2. The remainder of the window has flat metal bars, painted in a light colour. Note the dark contrast lines on the central bar

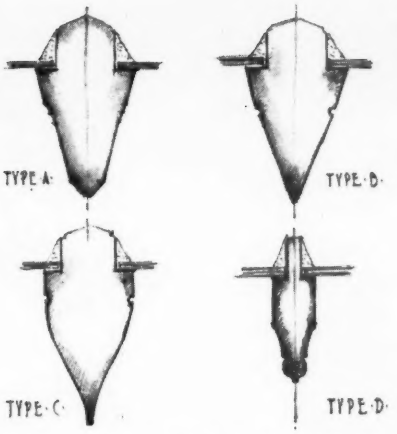


Fig. 2: Some forms of window bar. A and B: types tried at B.R.S. C: a classic form of bar. D: window bar from Sir John Soane's house

Fig. 3: A window partly treated with bars of type B in Fig. 2. The distraction and sensation of glare was much reduced. Only the central bar has the improved shape

1. *The object of attention should be bright and contrasty.*
2. *The immediate background of the object of attention should be almost as bright, but much less contrasty than the object.*
3. *The environment should not contain brightnesses and contrasts which compete with those on the object.*

The first and third of these rules are obvious because if our eyes tend to gravitate to the brightest and most contrasty thing in view, then these characteristics should be given to the object of attention—that is our first rule—and avoided in the background—which is our third rule. The reason for the second is probably less apparent. The explanation is to be found in the fact that if the object of attention is very much brighter than the background a condition of contrast will exist which will have a moderate adverse effect upon vision, and should the immediate background be brighter than the object of attention then a sharper condition of glare occurs accompanied by a considerable deterioration in vision. Thus we arrive at the statement that the object of attention should be only slightly brighter than its background. Cinema screens used to be viewed in darkness, but are now viewed in a half-light for the reason described.

When we consider the application of this group of principles to the daylighting of classrooms we shortly find ourselves facing a problem which architecturally is outstanding. Any source of light is bound to be brighter than the object on which its light falls. If, therefore, we want children to concentrate attention upon the teacher, the blackboard and the books on the desk, then the source of light itself, which is the view of sky through the window, should be reduced to a lesser importance. That is to say it should be screened in some way.

This was often the case in traditional design, for it resulted more or less automatically from deep window reveals associated with thick piers. This is not a course of action which is practicable today, and we have, therefore, to consider how the same object is to be achieved by other methods. The most obvious of these is by the use of louvres.

This is a growing practice in America, though we should note that it is also used for the control of sunlight both in America and some other countries where bright sunshine is a problem. Here we are thinking of it only as a technique to reduce the view of sky. In general either of two courses is usually followed in a design; medium-sized louvres may be employed, often made of wood or sheet metal, or more substantial screens, made perhaps of concrete or brickwork. Both can serve the purpose equally well for each can be arranged to any chosen angle of cut-off; most commonly this angle lies somewhere in the range from 30 degrees to 45 degrees on plan. One cannot be exact on a recommendation on this point because the complete cut-off from most viewing positions is not practicable, and an intermediate stage has to be accepted for which the criterion is merely it shall appreciably reduce the view of sky.

While there is no doubt that treatment of this kind can be successful, and in some cases may be necessary for a proper solution, there is a disadvantage about louvres which at present, at least, will probably limit their use in this country; they are almost certain to add to the cost of the building. It is most important therefore to examine another line of action, which is to accept the view of sky associated with large windows, but to reduce to a minimum the contrasts on and around them. By this means the distracting effect can be very much reduced and it becomes much easier for interest to be maintained upon objects of attention inside the room. Similarly, the strain and discomfort, and the impaired vision associated with bright and contrasty windows can be kept within reasonable limits. Let us therefore consider in detail on what basis we can modify window design to reach this objective. We will start with the window bar and work our way outward to the frame and surround.

If the window bars as seen from the inside present a pattern of strong dark against light, it will be found that the eyes fixate upon them and follow the pattern of the bars, travelling over and over them again, and one will experience difficulty in focusing attention upon a view outside no matter how attractive it is. In other words the pattern will attract attention strongly and tend to force a focus upon it. It will be worst if the pattern is close, and is relieved as the spacing of the bars increases; it is bad if the brightness contrast is strong and better if the contrast is weak. It is impossible yet to put a measure upon it, but some examples will give some scale to the effect.

Let us suppose there is a window with a view of buildings outside. The latter will be less bright than a view of the sky, and all contrasts between window and view are accordingly reduced. A dark-painted grid of window bars with small Georgian panes will not be uncomfortable to look at under these conditions, but will be found a pretty effective barrier to the outside view; the contrast is strong enough to draw attention, but not to irritate. If the bars are painted white one will not experience any difficulty in looking outside, nor will one experience such a strong tendency to look at the window itself.

On the other hand if we take a case where the view is mainly of sky, then even the white painted bars can present a sufficient contrast not only to draw attention, but to be very irritating when we do so.

In this case, however, much depends upon the shape of the bar. When this is flat inside, as most metal windows are, for instance, then we have the worst case,

because the full width of window bar is in shadow and the edges give a sharp contrast. Any shape tending to be elongated at a right angle to the plane of the window will be an improvement, but a very striking difference will be found between one shape and another even in this apparently limited range. It is worth while to examine this point quite closely. Obviously one way of reducing the contrast effect is to reduce to a minimum the width of bar in full shadow. Preferably one should start with a thin bar, but thick or thin it should come to a virtual feather edge. Some recent trials at the B.R.S. have shown that surfaces presenting an angle greater than about 40 degrees to the plane of the window received so little light that they also formed contrasts which were too strong. A section with such an angle on the inner edge is shown in Fig. 1 and 2A. The aim should be in fact to have the sides of the window bar strongly illuminated, and the section at B in Fig. 2 proved decidedly better in this respect as Fig. 3 will show. The chief reason why A proved less successful than B was because the inner edge of the bar is seen next to a view of the sky when viewed from an angle, so that shadow and bright areas were juxtaposed. The comparison is apparent in Figs. 1 and 3. Even B can be criticized, however, because the sides are darker than need be the case, particularly at the two edges which are seen next to the sky. The classic ogee curve was not included in the trials, but a section such as that at C seems likely to be very good. Its particular merit is that both the inner and outer edges are at a right angle to the glass and catch the light strongly. One is bound to draw the conclusion that shapes of this kind held their strong position in the history of window design at least in some measure because they provided the conditions of comfortable vision which the eye requires.

One final note about the window bar. In the trials at the station it was observed that stepped sides as shown at A in Fig. 2 produced such sharp lines that they too held one's attention. In B these were replaced by a groove, which has the advantage that light is reflected inside it so that the shadowed edge is not so dark as it would otherwise be. This was a marked improvement.

At D in Fig. 2 is shown a section of window bar by Sir John Soane for the windows of his own house. The drawing was kindly supplied by Mr. Summerson, the Curator of Soane's Museum. Soane seems to have been very sensitive to lighting and gave much thought to it. This particular bar is very successful, at least when painted a light colour. When stained a dark mahogany, as in some of the windows at the house, it loses most merit in the present respect.

Now let us consider the reveals, working from the outside edge inward. The outer edge of the reveal, like the outer edge of the window bar, is seen next to bare sky, and for this reason should be as bright as possible. In the stone windows of the Gothic period there was an outward splay which, because of its angle, caught the light very well. In the Georgian window we are familiar with the rendered and white-painted external reveal. Whatever the original intentions of the people who developed these details there is no doubt they were fundamentally sound from the present point of view. It follows that the practice of putting windows at the outer faces of the wall can be regarded as generally disadvantageous because, of course, it means that in place of a bright external reveal there will be the shadow line of the frame next to the view of sky.

This shadow line of the frame is our next point, but we can dispose of it quite quickly simply by noting that it should be reduced to the narrowest possible width and, of course, finished in a very light colour. It is one of the singular pleasures of fixed glazing that no frame shadow occurs.

In historical styles, Gothic and later, the inner reveal was commonly, though, of course, not always, splayed. This had an advantage in illumination, for it meant that the contrast between it and the surround wall, which is usually relatively dark, was very usefully reduced. Thus it will be seen that there was a sort of progressive reduction in brightness from the outer edge of the reveal to the inner face of the wall. There is no doubt that the gradual change from external brightness to the low level illumination inside made a big contribution to comfort, and it is not easy to see how we are to produce similar results in the depth of the modern wall. The problem has, however, been successfully circumvented by one idea in modern architectural vernacular, in which windows run the full length of the outer wall right up to the return wall across the ends of the room. In this way the whole end wall becomes a sort of deep reveal providing a gradual gradient in brightness. This is a point worth noting about school classrooms in particular.

The lintel of a window is a very special case of the reveal. Inherently it is more difficult, because all the surfaces, inside and out, face downward, and are therefore bound to be in shadow. The reflected light which reaches them from below is hardly enough to reduce a very aggravating contrast with the sky brightness, though it can help when fully exploited. Projecting canopies outside the window sometimes seem to help, but mainly by reducing the area of sky visible to those nearest the window. Also, of course, they avoid the aggravation of having the shadow of the window frame next to the view of the sky, which is always acutely uncomfortable. The Americans have indulged lately in canopies made of long louvres running parallel to the wall with the blades more or less vertical. These would be much brighter than the underside of a solid canopy, and therefore it seems likely that they can be made to do what is required in the way of reducing contrasts. In fact they are probably a very good idea. In any case, whatever else is done in this critical area it is most important to avoid such shadows as would be caused by a deep lintel beam or a heavy frame.

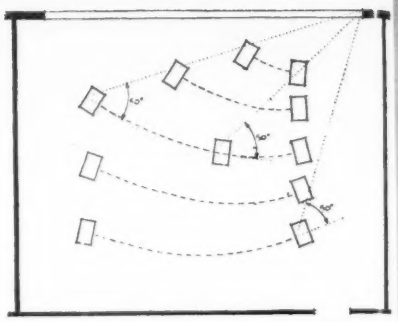


Fig. 4: An American example of classroom seating modified to direct the view of sky from the children's normal line of vision

At this point it is worth noting perhaps that the worst kind of window is one from which there is no view except that of sky. A low window cill is a useful thing because when people look outside, their eyes will gravitate to the view of neighbouring buildings and trees, and so avoid receiving the full impact of light from the sky. This is a significant argument for the low window cill.

We noted a moment ago that with modern thin walls there was not much chance of reducing contrasts by treatment of the reveal, but there is one other thing we can do which is important architecturally. We can if we wish arrange the windows in a room so that light from one will fall on the wall surfaces around another. This is one of the major uses of a clerestory, and apart from their use in schools, significant examples are to be found in recent examples of domestic work by F. L. Wright in America. The well-known pleasantness of lighting in rooms with windows on more than one side can be attributed largely to the same idea.

We come to two final points. Let us take note that the mere admission of a large amount of light into the room is a safeguard against excessive brightness ratios. Brightness outdoors cannot be controlled by the architect, but indoors it can be increased and generally the consequence will be a marked improvement in the comfort and value of the illumination through reduced contrasts. And also let us not forget that we can reduce the risk of sky glare to children in classrooms by different arrangement of the seating. An American example shown in Fig. 4 from the well-known schools in Mexia, shows an arrangement which was devised for this purpose, and there seems no reason to doubt that it would help a great deal, as was claimed on the basis of studies made there by D. B. Harmon.*

We have said nothing specifically about artificial lighting in this context, and it would add undesirably to the length of the present note to do so now; but it is desirable to say this much, that the natural and artificial lighting problems are similar in principle. In one case the sky is the source, in the other it is a lamp or a tube. In both

*From the ARCHITECTURAL RECORD

case our first course should be to prevent the source from being seen, or reduce the direct view of it; but when this is impossible or very difficult then, as with windows we have to study the fittings to ensure that on them, and round about them contrasts are kept within desirable limits. Adequate light should reach surfaces against which the fittings are seen, but of course the major part of the light should travel directly to the pages of books, desks, the teacher and the blackboard. All this probably rules out both completely direct light and the completely indirect, and there is certainly evidence to show that either of these courses leads to unsatisfactory results in the great majority of cases.

Conclusion. We have come down to some rather fine points of detail, and it is probably desirable to end by returning to a more general view for a moment. We have identified some good characteristics of windows which emerged in the course of historical development and which everyone seems agreed are very good windows; and we have identified some characteristics of human vision which apparently explain why we find these windows so satisfactory, quite apart from any charm we may discover on other grounds. This is interesting today because, æsthetic prejudice apart, we have to find some way of doing the same things ourselves, in our own way. It is not a matter of choice, but a problem fundamental to any vernacular of design because it has to do with the proper functioning of one of our special senses, and these provide virtually unchanging criteria of quality in design.

DISCUSSION

Dr. J. W. T. Walsh (National Physical Laboratory), speaking as an illuminating engineer, said he had found Mr. Allen's lecture of extraordinary interest, because, as Mr. Allen had said, the subject of glare was very similar whether it was approached from the point of view of the artificial lighting with which the illuminating engineer generally had to deal or from the point of view of natural lighting, which was the particular domain of the architect. He did not agree with Mr. Allen, however, that they were late in coming to grips with the subject, because at any rate in the realm of artificial lighting the illuminating engineer had been concerned with it for a good many years. Mr. Allen might make the comment that if that was so they did not seem to have got very far yet, and it must be confessed that that was true. It was a difficult and complicated subject, but in the realm of artificial lighting they had arrived at certain more or less empirical rules to guide them.

One was the avoidance of excessive brightness contrast. It was generally agreed among illuminating engineers that a brightness contrast in the case of any extended surface of more than about 10 : 1 was liable to cause discomfort and distraction, and should be avoided if possible; while if it could be kept below that figure, so much the better.

Mr. Allen, speaking of daylight, had said that the mere admission of a large amount of light into a room was a safeguard against excessive brightness ratios. It was known that the brightness of the ordinary view outside a window, with trees, buildings and so on, was of the order of one-fifth to one-tenth of the brightness of the sky at the same instant, so that there was a contrast of from 5 : 1 to 10 : 1, which was just about comfortable. Inside the room, looking at papers on a desk, with a daylight factor of 2 per cent, the brightness of white paper would be approximately one-fiftieth of the brightness of the sky. It followed, therefore, that the contrast between the brightness of the papers on the desk on the one hand and of the trees and buildings outside on the other was of the order of 5 : 1 to 10 : 1, which was within the limits of comfort. It was clear also that a view of the sky alone outside the window was bound to be glaring, with any practical daylight factor on the desk, but that if one could arrange to have a view of trees, buildings, etc., occupying one's normal field of view when one looked up from one's work, one would be within the limits of comfort.

That was one of the conclusions to be drawn from the lecture. It was necessary to provide (*a*) adequate daylight on the desk, at least 2 per cent, and (*b*) that what would normally be seen in one's field of view was not the sky but some external objects illuminated by it.

There was another empirical rule which illuminating engineers had evolved, and which had been for some years now incorporated in legislation, namely, the avoidance of any excessive brightness at an angle of view at the eye of less than 20 degrees, and preferably 25-30 degrees. The reason was that it required a conscious effort to look much above the horizontal, and if one were looking horizontally and there was an angle of 30 degrees up to the nearest bright source, that source was sufficiently far removed from what one was looking at not to cause excessive discomfort or interference with vision. Applying those two rules in the present case, it would appear that conditions would be good if one could see no sky from one's normal working position at an angle of less than, say, 25 degrees.

Mr. William Allen, replying to questions, said that the difficulty about the use of special diffusing glasses to avoid glare was that in order to disperse the light they picked it up and scattered it rather widely, and therefore tended to become bright themselves—brighter in patches than the sky itself. If sunlight fell upon them they became extremely bright, and so aggravated glare. At the same time, their transmission factors were always lower than that of clear glass, and they tended to pass less light into the room. He did not, therefore, regard their use as an aid to the reduction of glare, although sometimes with very skilful use it was possible to obtain benefit from them.

Asked whether the problem of glare would not be largely removed by lighting from the back of the room, and whether a ceiling which sloped down to the focal wall would not also assist, while eliminating the conflict of interest between window and teacher, he said that he did not see why that should not be the case, although he thought that the teacher would suffer a disadvantage. The matter could best be studied on a model scale, and they were hoping to be able to provide facilities for large-scale model studies of illumination at the Building Research Station.

Asked whether the colours of the floor and of the desk surfaces were material factors in considering the problem of glare, he replied that in general the difficulty of the Research Station was to find a floor surface of any kind; but, looking to the future, probably the colour of the floor in an ordinary classroom was not as important as the colour of the desks, which must fill the greater part of the field of view. The colour of desks had been the subject of a great deal of attention in America recently, and had also received some attention in this country.

The provision of a reflecting surface such as light paving on the ground outside the classroom window was of advantage in giving some reflected light on the under side of the window head, and had been recommended by the Building Research Station as something which could be done in existing schools. It was also of value, of course, in new schools.

External vertical light baffles, if correctly placed, might serve a useful purpose in cutting out sky glare, but were not so convenient as canopies. *Post-War Building Studies* No. 12 showed an arrangement of vertical and horizontal light baffles built of big screens with concrete and brick which would serve the purpose.

Asked what would be a reasonable natural light in ft.-candles to expect on desks furthest from the window wall in December, he said that the question really was what the 2 per cent daylight factor would mean in the middle of December, when the light was poorest. On some days the light outside dropped well below 100 ft.-candles, and 2 per cent of that would be 2 ft.-candles.

One questioner stated that to obtain the desired 5 per cent level of illumination it had been recommended that the clerestory over the corridor should be extended as a roof light, but that would in effect provide a window giving a sky view only, and would therefore not be desirable. Were louvres, fixed or movable, necessary in that case? Mr. Allen replied that that was a case where louvres might be extremely useful. People were very cautious on the subject, and there had not been much experience of such windows; but a design had been shown by Mr. Stillman which involved external projecting fins, and that exemplified the same idea and should serve an important purpose. The reduction of contrast round windows of that kind was most important.

On the question of fluorescent versus tungsten lighting, he said that all over the

world people seemed to be coming to the conclusion that the installation of fluorescent lighting in schools was a good thing, probably because it could well be mixed with natural daylight. There was no evidence that, if properly designed, it was harmful to the eyes of young children.

Mr. P. J. Waldram [*L*] suggested that Mr. Allen and Dr. Walsh were leading their hearers up the garden to a wholly wrong conclusion. They had concentrated on the contrasts on the borderline between indoors and outdoors, and had thereby disguised the most important contrast of all, the contrast between black type and the white paper on which it appeared, and on which the children's attention was concentrated for many hours a day. Contrasts between outdoors and indoors on the borderline were comparatively slight, though they might be distracting, but the contrast of black and white on the printed page was all-important to the children's eyes.

It was not without significance that adults who were free to choose, often avoided reading or writing out of doors for long periods because they found it trying to their eyes; and that not only in strong sunlight; from a hemisphere of sky completely overcast with thin and therefore bright cloud more ultra violet radiation was obtainable than from direct sunshine.

The minimum natural lighting of post-war classrooms called for window walls glazed from end to end and from desk level to ceiling assisted by some form of clerestory or the top lighting which was at one time forbidden (and I think rightly forbidden) by the Board of Education. Would not this abnormally powerful fenestration, however, create the very conditions which we found most distressing for prolonged outdoor clerical work, namely powerful photometric intensity, accentuating the strong small scale contrast of black type on white paper.

Regulation No. 39, which called for a minimum of 2 per cent daylight factor in class rooms not only increased the pre-war official minimum of 0.5 per cent, it multiplied it four times over. The cost would be colossal because top lighting precluded multi-storey buildings and it would be difficult to find in towns, at any price, sites which would accommodate the sprawl of single storey classrooms for all the additional new schools required by the raising of the school leaving age. The old standard had stood the test of practical application for many years in many countries without serious, if any, complaint. The question naturally arose as to whether this revolutionary increase of long-established well-proven practice was not merely necessary, desirable or even wise; but as to whether it was not misconceived, and even highly dangerous.

The old standard was arrived at in this country many years ago in the very early days of the development of the modern technique of measuring and predetermining natural lighting by a joint committee of doctors and illuminating engineers who made photometric surveys of the natural lighting, good, bad and indifferent in a number of London and provincial schools. It had been found that in the modern buildings with their classrooms obviously amply lit all over by means of generous high windows on one side facing into large open playgrounds, a daylight factor of about 0.5 per cent was consistently recorded on the back desks. As far as he knew no school master, mistress or inspector had ever complained of inadequate light in any class room which enjoyed 0.5 per cent daylight factor on the worst desk; nor was there, he believed, any published record of any school medical officer which specifically attributed the defective or deteriorating eyesight of any single child to such inadequacy. Inadequacy seldom escaped notice. It was usually the first, and in this country was often the only cause of complaint as to natural lighting.

The report (Post-War Building Study No. 12) of the Committee on the Lighting of Buildings appointed during the war by the Building Research Board left no doubt whatever that they attributed the well-known deterioration in the eyesight of children during the school years to the theoretical inadequacy of the pre-war official minimum, for their report recommended that for post-war ordinary school class rooms it should be multiplied by no less than 10 to a 5 per cent daylight factor, or reinforced to that extent by installing sufficiently powerful artificial lighting, with more for fine work. Although the Ministry of Education had subsequently reduced this by no less than 60 per cent to 2 per cent and entirely disregarded the still higher minima recommended for drawing and needlework, Regulation No. 39 was probably only a dangerous guess because no results of *ad hoc* research had yet been published. It was therefore good hearing to learn that Regulation No. 39 was now under review and therefore under suspicion. Still more welcome was the news that at long last the assistance of the Medical Research Council had been enlisted. This was not a problem for architects, nor for scientists, it was a purely medical question for ophthalmic and physiological specialists. It was, however, an urgent one.

Mr. Allen, in reply, said he did not see the force of Mr. Waldram's point that the major problem of contrast was in reading black print on white paper under an illumination which for six months in the year was not likely to exceed 20-25 ft.-candles. If that were so, countries which were pushing office lighting up to 40-50 ft.-candles must be doing infinite damage, which he hoped was not the case. Mr. Waldram's point about the thin, overcast sky being the brightest brought one back to the fact that the window contrasts under those conditions were the most uncomfortable things with which one had to contend. The personal observations of individuals, however, would enable them to judge between the two points of view.

In respect of the assertion that no fault had been found with the old recommended value of 0·5 per cent daylight factor, he had observed with interest that in a bibliography of all American work on natural lighting in the last ten years, by far the largest group of references concerned school-lighting, chiefly daylighting. This seemed to suggest that the old standard had, in fact, been found inadequate.

Heating and Ventilation:

C. C. Handisyde, A.A. Dip. [*A*]

MR. HANDISYDE said he did not claim to be an expert and intended to ask some questions from the architect's point of view after which Mr. Copeland Watts, who was a heating consultant, would, he hoped, answer some of them. Before the war many school architects had experimented with heating systems but very little of their experiments had been published. He went on:

Last year at the Fuel Conference in this room I read a paper on domestic heating and I put a good deal of emphasis upon the question of 'comfort' as opposed to mere warmth. The first, and probably the most important, thing to be discussed this morning is what we mean by real comfort in the heating of schools. I fully appreciate that in the immediate future there is going to be an urgent need for economy, both in capital outlay and in fuel consumption, but unless we are quite clear what our real objectives are, I very much doubt whether we are likely to make the best use of available resources, and I should like to make the point that carrying on with a well-recognized technique is not always an economy. Sometimes a new idea may be both more efficient and at the same time more economical. There is an example of that in the heating of houses. In the last year or two there has been a good deal of discussion about heat insulation, and it has been recognized to be a good thing. To start with it was said that we could not afford it, but it is now realized that we can get better heat insulation than before and sometimes at a less cost than with the traditional 11 in. cavity wall. I would emphasize, therefore, that first we must try to determine the ideal conditions of heating and ventilation to be aimed at and then to examine the extent to which these can be met and the best methods to adopt during the present economic situation.

A reasonable control of heat loss from the body is essential. This will be obtained partly by convection, partly by evaporation and partly by radiation. The first two of these are affected by the amount of air movement in a room and, since normally air movement is related to ventilation rate, we arrive immediately at what I believe is

one of the most vexed questions in school heating, namely, how much ventilation is really required. There are four questions here which I should like someone to answer. Within the possible range of ventilation rate in a classroom, will there be any significant difference in the spread of airborne disease? In fact, will an increase in ventilation, within the possible limits, decrease the rate of infection by diluting it or will the additional rate of movement merely blow dust and infection about rather faster and instead of reducing infection leave us 'all square' or possibly even worse off?

If the answer to the first question is that infection is unlikely to be appreciably affected by rate of air change, one can assume that the guiding factors on the amount of ventilation required would then be: (*a*) sufficient air change to prevent body odours becoming unpleasant, and (*b*) sufficient air movement to ensure an adequate feeling of freshness. I suggest that this feeling of freshness is obtainable very largely by air movement without the air itself necessarily being introduced directly from outside. It should be noted here that air movement can be obtained without having a large air change. I am not necessarily saying at the moment that it is economical to do so—that is a question for a heating engineer to answer.

My third question on ventilation is necessary in order to bring the matter down to a practical basis. How much does the rate of air change contribute to the cost of the heating system in both running cost and first cost?

My fourth question is how can the rate of air change be regulated if the normal open window method of ventilation is used? I suggest that outside laboratory experiments it is an impossibility, and is likely to remain so.

The present Building Regulations ask for a minimum air change of six times per hour in classrooms. How are the authorities going to determine this? The regulations also ask that half the window area should be openable. This presumably is for summer ventilation and has nothing to do with winter conditions. Incidentally, American schools and, I believe, many Continental ones, have a very much lower air change than that to which we are accustomed. Is there any evidence that there is a higher incidence of air-borne disease in such schools or that comfort conditions are any better or worse?

There is one new factor which might before long have an appreciable influence upon the high ventilation rates which are in favour. I refer to the use of germicidal lamps. I believe that good results have been obtained in large-scale trials in America, and it would be interesting if an authoritative view of the future possibility of such installations could be given.

I have dwelt at some length on this question of ventilation because I believe that it is one on which there is need for a good deal of clarification, and also that it is one of the important factors in heating costs. Finally on this point I would like to ask those with a close experience of schools whether they have any statistical evidence of the way in which windows are in fact used during the winter. I have heard some architects with considerable experience of schools say quite definitely that most teachers nowadays are fresh-air fiends and have windows open to some extent in all weathers. Others declare equally firmly that the windows in the schools which they visit are hardly ever opened in cold weather. If it all depends upon the teacher, is the present method entirely satisfactory? Would it be better to instal some system of mechanical air change, or, if that is ruled out on grounds of cost, or for some other reason, would it be better to have some form of constant flow ventilator to give the minimum required air change in cold weather, and to open the windows only in warm weather?

Leaving ventilation, I should like to return to the question of comfort as it is affected by the method of heating. There are numerous methods which might be used, hot-water radiators and pipes being by far the most common. Are these really adequate from the point of view of comfort? Clearly there is a strong temptation to use this method; the architect knows that if he adopts it, any competent engineer can do a job which will work; the installation problems are well understood, and no awkward details have to be worked out. The school authorities favour the method for much the same reason; they know that it will work and that there are unlikely to be any serious criticisms.

On the other hand, a number of adventurous people have tried out other methods. Panel heating in floors or ceilings has been installed; high, or medium-high, temperature radiant heating by electric fires or panels, sometimes at high level and sometimes at low level, was tried in a number of schools before the war. The number of people who feel that an ordinary radiator system does not give ideal heating conditions in homes, offices, and so on, is quite considerable, and in classrooms there are several reasons why I should not expect this method to be ideal. To mention two of these, I would put first the inevitable high floor-to-ceiling temperature gradient—a condition which is generally considered to be bad for comfort. Secondly, I suggest that almost inevitably some children will sit too close to a hot radiator.

I should particularly like to hear the opinions of those with experience on the comfort and cost aspects of panel heating. There have been installations of this type where there has been insufficient local control, but this should not be allowed to damn the system. Could we first of all clear the air by having a firm opinion on floor versus ceiling panels? Personally, for classrooms I believe that desks give too much shielding for ceiling panels to be satisfactory.

If floor panels are considered, several questions arise. Perhaps one of the most important is the maximum permissible floor surface temperature. When I investigated the possibility of installing such a system in a school—this was before the war—I was told by all the best people that a surface temperature of 70 degrees F. was the upper limit without discomfort from overheating of the feet, and I have heard some engineers say 65 degrees F. On the other hand, in America 80 degrees F. is generally considered quite safe, and some engineers design for up to 85 degrees F. Even allowing for the higher air temperatures demanded in America, there is still a considerable difference to be accounted for. The matter is not of purely academic interest, because with the present rates of air change it is not easy with a limit of 70 degrees F. to get enough heat into the room, but at 75 degrees F. the situation is much easier. Is 75 degrees F. now considered satisfactory for comfort?

If floor panel heating is used, the obvious system for ground-floor rooms would be copper tubes embedded in the surface concrete. Curiously, however, a number of schemes in this country use a suspended floor, with pipes warming air which in turn warms the floor. Could we be told why this method is used? Could we also be given any data which members may have on the probable cost of these two systems? Many people will say that panel heating is out of the question because it is too expensive, but would this really be the case if it were designed in the most efficient manner?

I raise this point because of a recent experience of which I have heard. A panel heating system was being designed for a small house, and a reputable consulting engineer with considerable experience of panel heating produced a scheme. The architect happened to be aware of recent trends in panel heating in America, and, having produced the literature and persuaded his engineer to study it, the immediate result was a cut of something like 40 per cent in the copper pipe content of the job. Further queries by the architect produced several other considerable savings. I quote this example not in any way to criticize heating engineers, but merely to show that, because panel heating is not at present a very common practice, we have not yet been able to work out all the finer points which may help to improve efficiency and reduce costs.

One other point on panel heating is of particular concern to the architect. Has anyone any experience in using various forms of floor finish suitable for classrooms with floor heating? It seems to be generally agreed that a composition block remains unaffected by the heating system, but we do not all like composition blocks. I believe that the problem may be more difficult in schools than in many other types of building, because in the middle of the winter school heating is likely to be shut off for the Christmas holidays, when there may well be very damp weather. What type of floor finish will withstand this condition? I believe that this may prove to be the key problem in low temperature panel heating in schools.

I have concentrated mainly upon questions relating to classroom heating, but, returning for a moment to ventilation, there is one point on school halls on which I should like to hear views. It seems to me that the maximum amount of ventilation is required at times when school plays, and so

on, are given. On such occasions it is usually necessary to have the windows curtained, and the curtains therefore prevent proper ventilation just when it is most needed. Would not it be better, and probably cheaper, to make all hall windows as fixed lights and provide proper natural or mechanical ventilation entirely independently?

I have left until the end two aspects of heating which are of especially close interest to the architect. The first of these is the control of heat loss from the structure by adequate insulation. A good deal of attention has been paid to the better insulation of houses, and some of the new methods of construction have included good insulation in the walls. In many classrooms so much of the wall is glazed that I question whether it is worth worrying very much about the remaining small area. This holds good for the series type of plan. If you have the 'elbow axis' type with three or four external walls, there is a large area of wall which needs attention. The windows are a big source of loss by transmission, quite apart from loss by excessive ventilation. I cannot see any hope of improving this situation until a reasonably cheap form of double-glass unit is marketed in this country; the double window is too clumsy and expensive. If ever this does happen, not only will heat loss be greatly reduced but comfort should also be appreciably better. Meantime we might concentrate more on floor and ceiling losses. With a solid ground floor the heat transfer is comparatively small, though in view of recent American information about heat losses from the edge of solid floor schools it would be interesting to know whether this is an important factor in our climate. In particular, does this type of loss need special consideration in cases where floor panel heating is used? Where the ground floor is not of solid construction, I suggest that the insulation should be brought up to a level of 0·15 B.Th.U./sq. ft./hr./°F.

In single-storey schools or on the top floor of other schools heat loss through the roof is liable to form a considerable proportion of the total. It is not usually very difficult or expensive to include insulation in most types of roof construction. Could we have some guidance on what has been found to be economic? It should be remembered that in the case of roof insulation there is a useful improvement in comfort conditions in summer as well as the fuel saving and improved comfort in winter. Would a U-value of 0·2 be a reasonable minimum to ask for in roofs?

Finally, I should like to ask those who have recently been designing schools with loose, spreading plans whether they are finding that the new type of plans suggests that new methods of heating are required. Is there, for example, a case for using some form of localized heating instead of one large central plant? If there is anything to be said for this, then are the practical difficulties of operating numerous small solid fuel boilers, of the latest magazine fire and thermostatically controlled types, so great that localized heating, if used, would have to be by gas-fired boilers or by electrical methods? I should also like to ask whether engineers consider that the latest suggestions for daylighting of schools will add seriously to the problem of providing comfortable heating, and also whether they will add seriously to the cost of heating.

I am fairly sure that someone will want to ask questions about solid fuel versus gas and electricity, but I think that it is much more important for the architect to concentrate on the comfort aspect of heating and leave the arithmetic to the heating consultant. I should like to ask, however, in general terms, whether the fact that solid fuel has gone up a great deal in price compared with electricity is going to alter the whole of the picture as we have been looking at it in the past.

I realize that I have only touched upon certain aspects of the heating of schools in the time available. I hope, however, that I may have started enough hares to provoke a discussion which will persuade those of you who have a great deal of experience to say what has been tried and with how much success—or otherwise?

DISCUSSION

Mr. Copeland Watts said that some of the questions asked by Mr. Handisyde could better be answered by physiologists and bacteriologists, but a number with which a heating engineer could deal he would endeavour to reply to. Under the 1944 Act, Statutory Rules and Orders had laid down the temperature and air changes required in schools. The requirements varied according to the use to which the room was to be put, but the teaching rooms required a temperature of 62 degrees F. with six air changes an hour with 32 degrees F. outside, while elsewhere the temperature varied from 55 to 65 degrees F., according to the use of the room, generally with three air changes.

Six air changes meant a great deal of air to warm, but he understood that it was the intention of the Ministry that the metabolic heat should be taken into account when designing the heating installation. He had had an opportunity of discussing the matter with the Ministry's architect, and it appeared that six air changes were required only when the room was fully occupied, so that if the metabolic heat of the occupants was taken into account the air required to be warmed was only three to three and a half changes per hour in the teaching rooms, when schools were built to the minimum requirements of the regulations. As the regulations were not at all clear, he understood from the Ministry's architect that they were being revised to clarify the position, and that the air changes to be warmed would be stated to be three in classrooms and between one and a half and three for other types of room.

There was at present a proviso in the regulations that when the outside temperature fell below 32 degrees F. the air temperature specified for the various types of room should not fall more than 5 degrees below that specified. This proviso will not appear in the new regulations but the designer should, however, allow a reasonable margin on the boiler plant to meet such conditions.

The degree of ventilation required was a matter outside the province of a heating engineer, and was a matter for the physiologist or bacteriologist. Last year, however, he had had the opportunity of investigating heating and ventilating practice in Germany, and he noted that in German schools double windows were provided, arrangements made to exclude the entrance of air when doors were shut, and in fact everything was done to avoid air change as much as possible. As far as he could ascertain, the health of the children did not suffer as a result, and the children seemed to be bright and to show no sign of lassitude at the end of the morning's work. That was a point which physiologists in this country should consider, as we might be making too much allowance for ventilation.

He had checked up the effect of ventilation on the running costs and first cost of heating installations in some recent buildings. Where the installation was designed for 62 degrees F. inside with 32 degrees F. outside, and three air changes an hour, by reducing the air changes by one throughout the school a saving of about 15 per cent. in capital cost would result, and there should be a fuel saving of about the same amount.

As Mr. Handisyde pointed out, accurate control of ventilation by means of window openings was impossible. The only way to control air change within reasonable limits was to employ a balanced system of mechanical ventilation, but this would mean very considerable additional capital cost, and in practice it did not appear to be justified. He had never employed mechanical ventilation throughout a school, though in the assembly hall it was common. He had figures in connection with office buildings where mechanical ventilation had been employed throughout, as compared with others where there had been no mechanical ventilation, and there appeared to be no material saving in fuel consumption when employing mechanical ventilation.

It was not possible to give any definite answer to the question of how windows were used in the winter, as this seemed to depend on the personal idiosyncrasies of the teaching staff; but as the temperature approached the desired room temperature so the number of windows opened tended to increase. There were within his experience two similar schools, one heated by the usual method of radiators served from a coke-fired boiler and the other by electricity, with direct electric heating in every classroom, thermostatically controlled by the room temperature. It had been hoped to show that by employing thermostatic control the running costs of the electrically-heated school would not be materially different from the other; but in practice it was found that the thermostats rarely came into operation, because as soon as the room temperature approached that at which the thermostat would operate the teacher would open the windows and render the thermostat inoperative. It was possible that the same position arose with any form of heating where the control was by room tem-

perature alone, and that therefore control by both outside and inside temperature would lead to greater economy.

On the question of which form of heating would best give comfortable conditions, he thought that provided the scheme was properly designed there was no reason why any of the alternatives available should not give satisfactory results. Some methods acted mainly by convection and some mainly by radiation, and some by a combination of both, but generally it could be said that satisfactory heating could be provided with any method. He suggested, however, that to attempt to warm by warm air only, without some direct heating surface adjacent to the windows to make good the very high radiation loss through the windows, would not give satisfactory comfort conditions, so that where warm air was being employed he always liked to provide some direct heating surface for that purpose.

Under-floor heating had been employed to a considerable extent in Derbyshire, and the results seemed to be very satisfactory. When using radiant heat, the under-floor method seemed more suitable than the ceiling, because there was less shielding of the children's bodies from the source of heat. It also had the advantage of keeping the children's feet warm and their heads cool. In practice it was usually necessary to put a small proportion of radiant heat in the ceiling, as the floor area alone was insufficient to give the heat input required. Objection was sometimes made to under-floor heating on account of the dust and dirt brought in on the shoes of the children, which tended to circulate in the air with the convection currents set up. Bacteriologists could say whether it was objectionable from the health point of view.

As to what was the most desirable method of heating, research by physiologists was required. The heating engineer could heat a building in a number of different ways, all of them reasonably satisfactory; the proportion of convected heat to radiation could be varied within wide limits, but they were waiting to be told the optimum proportions. Mr. Handisyde raised the question of using high-temperature radiant heat. That depended very largely on the height of the room, because considerable discomfort could be caused if a high-temperature radiant surface was within close proximity to the occupants.

Mention had been made of the temperature gradient with radiators. He had measured the temperature gradient with radiators in the room and with radiant heat under the floor and in the ceiling, and found that there was a lesser temperature gradient from radiant heat whether in floor or ceiling. It was probably due to this that the cost of running a radiant heat system was less than the cost of a radiator system. The initial extra cost of embedded panels as compared with the cost of radiators was of the order of 20 per cent. If those panels were in the ceiling, special attention had to be paid to the plaster specification, to avoid the risk of falling plaster later, and that also had an effect on the total cost; but it had been found that the fuel consumption with embedded panels was less than with radiators for equal comfort, and after the building was thoroughly dried out—say, from the third winter onwards—the saving in fuel costs was probably at least 10 per cent, at the most conservative estimate.

The question of floor temperature had also been mentioned. Modern practice was to limit the floor temperature to 75 degrees F., which was a little higher than the figure of 70 degrees to which Mr. Handisyde referred, and was attained only during the coldest weather, so that for the greater part of the year the floor temperature was below that figure. With floor heating, a surface temperature not more than 10 degrees F. higher than room temperature would probably give satisfactory results.

With regard to the material to be used for the embedded pipes, modern practice was to use steel tube in preference to copper, unless there was a risk of corrosion, for example, from the material used for the floor finish. There seemed to be no advantage in using copper instead of steel pipe when used in the ceiling, and there might in fact be a disadvantage, as there was less adhesion between the copper and the concrete or plaster.

When floor heating was provided, the question of floor finish must receive careful attention. Certain composition tiles had been found satisfactory, but their appearance was not always acceptable. Hardwood blocks or strip flooring on concrete was also satisfactory so long as well-seasoned wood was employed. It should be remembered that the temperature was always kept lower for floor heating than when radiant heat from ceilings was used, so that if the wood was normally dry when installed there should be no undue trouble due to shrinkage. Mr. Handisyde had referred to difficulties caused by absorption of moisture during holiday periods when the heating was off. From other points of view it was desirable to keep the heating going at such times of the year or there might be deterioration of the building due to condensation.

Insulation was of value in any type of building, even where the percentage of glass was high. The total saving of fuel due to insulation might be less in a school than in an office building, but there would nevertheless be a saving. He had compared the heat losses in a number of schools, and found that generally 30 to 40 per cent of the total heat loss was due to air change, and that the loss from the structure was 40 to 45 per cent. It would be seen, therefore, that if the structure could be insulated so as to reduce that loss by half, a saving in the fuel bill of 20 to 25 per cent would result. It was usually found that the saving in the capital cost of the heating installation went a long way towards paying for the insulation of the structure, any small amount remaining being paid for by the saving of fuel in the first year or two. In other words, the provision of insulation was usually a good investment.

Mr. Longworth, speaking as a heating engineer with a special interest in fuel consumption, said that ventilation clearly loomed large in the picture, and so did the question of the daylight factor and the general layout of the building. He had tried to envisage the problem on the basis of the actual fuel which would be consumed. A useful unit for that purpose was the consumption of fuel over a season per 100 scholars. From *Post-War Building Studies* No. 27, before the war this amounted to something like 15 tons. That was necessarily a low average, because it included so many old buildings where the heating arrangements were probably quite inadequate. The schools which were being built shortly before the war would require about 20 tons per season per 100 scholars. It was interesting to compare that with the predicted consumption of schools designed to the standards now being considered. Taking a typical three-form entry school, with the suggested 5 per cent daylight factor and traditional standards of insulation, one might expect the consumption to rise to 50 tons per 100 scholars per year. Carrying into effect the recommendations of the Egerton Committee for the improvement of insulation values would probably reduce that consumption to about 40 tons, and a further improvement in that direction, such as Mr. Handisyde had indicated, should reduce the figure to about 30 tons.

It seemed that one might expect an increase in the fuel consumption of schools to twice the previous figure within a very short time. He felt, therefore, that special consideration should be given to the following points: the highest practicable standard of structural insulation; the lowest acceptable rates of fresh air change; and full-scale experiments on standard construction into the effects of intermittent heating of school buildings in general. He suggested new values of roofs and floors of 0·15, a reduced air change, and some control over the way in which ventilation was used.

He agreed with Mr. Watts that the most common criterion for opening the window was the temperature condition in the room, but he would go further than Mr. Watts did and suggest that thermostatic control should be arranged in relation to the outside conditions entirely. By such a method, with a properly-designed system the heat input into a classroom could not exceed that which would cope with the designed ventilation rate, and, if the teacher desired a higher rate, he would at once have warning in the fall of the temperature of the room.

Questions: Asked whether the system of heating first installed in Derbyshire schools many years ago had been given up because it caused the mud to dry and might cause feet to swell, Mr. Handisyde said he did not know why it had been abandoned, but he did not think that the feet would swell with floor heating, provided the system was correctly designed in accordance with present knowledge. The important factor was floor surface temperature, which it now seemed to be agreed could go to 75 degrees F.

Asked whether with floor panel heating there were not considerable losses into the ground, and whether there was any method of preventing this, Mr. Copeland Watts replied that it was not usually necessary to put insulation in the floor, but it could be done if wet ground was expected. When the ground under the building dried, it acted as a good insulator, and if there was a reasonable thickness of concrete the loss was not great.

A questioner, referring to the fact that in proposed new schools of the Hertfordshire County Council the heating system was stated to be by warm air, asked whether, other things being equal, warm air heating was not the least economical method and whether, in schools where large air changes were necessary, a proportion of radiant heating would not reduce the cost. Mr. S. Morrison (Herts C.C.) said that it was difficult to answer that question. Some form of panel heating was usually recommended today, but they believed that there was a practical objection to it. In most systems where pipes were embedded in the ceiling or concrete floor there was a very high heat capacity and it took a long time to build up the heat and before the heating system responded to any control. In the new type of school building, with very large windows and a southerly exposure, it seemed likely that the effect of the sun would be to boost the temperature quickly, and some system of heating which responded quickly to control should be advantageous for both comfort and fuel economy. It seemed unlikely that that could be obtained purely with floor heating, and they felt that the answer was probably a combination of their method of warm air heating and some radiant heating.

Dealing with the suggestion that while the floor system of heating might be satisfactory for children in nursery schools, who spent much time in playing on the floor, the rather high temperature suggested might be dangerous to their health, Mr. Handisyde agreed that in such circumstances it would be necessary to be very careful about the floor surface temperature. Panel heating in the floor would be the most satisfactory system, but with a temperature of 70 degrees F. rather than 75. He understood that Mr. Watts agreed with that view. In considering the type of surface material which should be used, the question was whether a floor was uncomfortable because it was hard or uncomfortable because it was cold. Some of the apparent discomfort of a hard floor disappeared with floor heating. In a nursery school the question of cleanliness was also important.

Mr. Handisyde, on the question of convection versus radiation methods, said it was a question for the physiologist, but in his view any system which relied entirely on convection was bound to give rise to a high temperature gradient from floor to head level and therefore be unlikely to give the greatest comfort. No satisfactory answer was available to the question of what were the relative efficiencies of heating the human body by convection, by radiation and by conduction, but he believed that a fairly high proportion of radiation was required. He did not believe that humidity was an important factor in comfort in this country.

Asked what margin of boiler power should be provided to ensure good conditions when the outside temperature was below 32 degrees F., Mr. Copeland Watts said that it was the usual practice to provide a margin of 25 to 30 per cent on the boiler. That should normally suffice, though it might not have been adequate last winter. Comparative costs of solid fuel and oil firing were a matter of local conditions, but taking average costs for the country as a whole there was not much to choose between them. Oil firing was more efficient than a hand-fired solid fuel, but with adequate control of solid fuel firing it could not be said that one was more efficient than the other. In saying that there was little difference in cost between the two, he took account of the saving of labour with oil fuel.

On the question of the relative merits and cost of copper and steel pipes, Mr. Handisyde said he had favoured copper pipes, but Mr. Watts had mentioned that modern practice was to use steel. He had thought that copper pipes might be preferable because long lengths would be easier to handle, and he had the impression that they were preferred in America. He agreed that it would be more difficult to get satisfactory adhesion to the plaster, but he did not favour ceiling panels in any case.

Mr. Copeland Watts said that in his experience steel pipes were satisfactory and durable, so that it was not necessary to go to the extra expense of copper. He had a piece of steel pipe in his office which had been in for 27 years and was as good as new.

Asked for his views on the relative merits of a single central heating plant as compared with a number of smaller units, Mr. Handisyde pointed out that much depended on whether the plan was very strung out or not. With solid fuel, delivery to scattered plants might be a difficulty.

Mr. Watts said that if a number of small plants were used there must be good thermostatic control, and therefore the cost would probably not differ materially from that of the centralized plant. Replying to a further question, he said he saw no reason why four schools on the same site should not be heated satisfactorily from a central boiler-house, and possibly better than with individual boiler plant.

The normal method of heating school drying rooms was to put in pipe coils below the racks on which the clothes were hung, but in some cases warm air was blown by a fan over the garments. One of those two methods was probably the most suitable for schools, but each requirement must be investigated on its merits.

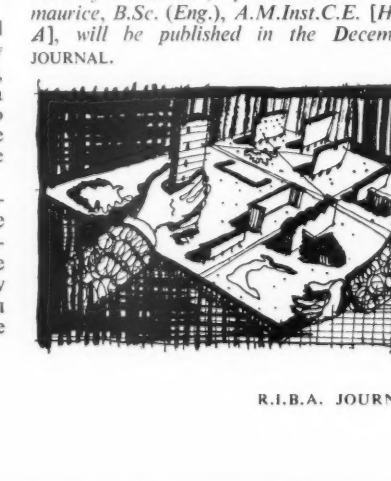
Asked what was the best solution to prevent down-draught from top lighting, he said that he always liked to put some heating surface underneath the source of the down-draught. If architects would allow heating engineers to put a pipe under a clerestory window they could stop the down-draught.

Answering a question about the heat pump, Mr. Watts said that this was a reverse cycle refrigerator which raised low-grade heat to a point at which it could be used for heating a building. The low-grade heat could be obtained by burying pipes in the ground and circulating through them some medium which picked up heat from the surrounding ground, that heat being raised by the heat pump to a useful level. It could also be done by taking heat from the air or from rivers. He was not prepared to say yet that it was an economic proposition.

A questioner suggested that it would be interesting to hear something about the questions which Mr. Handisyde had said were the domain of the bacteriologist, and the Chairman asked whether anyone present could say which system of heating made the school the 'least efficient germ exchanger'. Mr. Handisyde mentioned that some work on the subject, not with special regard to schools, was described in the report on heating of the Post-War Study Committee. A great deal of work on it had been done in America. He had discussed the matter with two of the leading workers in America, and they were convinced that the prevailing ventilation rates were on the whole considerably higher than were necessary from this point of view. On the other hand, there were authorities in this country that did not agree. It called for work by the Medical Research Council such as was being done on the subject of lighting.

Mr. G. A. Atkinson [*A*] mentioned that in Germany, where double windows were used and ventilation was very bad, and also in Canada, where restricted ventilation was employed, he had heard that the incidence of tuberculosis tended to be higher than where the ventilation was better. It might be better and more economical, he thought, to have higher classrooms and more air in the room and less air change. The planning of schools seemed to be influenced largely by considerations of lighting today, with much less emphasis on heating. There was a fuel crisis in this country, yet it had been said that we were going to use twice as much fuel in schools as in the past, partly because of modern planning.

Part II of the report, consisting of papers on 'Acoustics', by Mr. Hope Bagenal [*F*] *and 'Use of Materials', by Mr. Robert Fitzmaurice, B.Sc. (Eng.), A.M.Inst.C.E.* [*Hon. A*], *will be published in the December* JOURNAL.



Sources of Information for Architects

By Colin T. Penn [*A*]

Read at a Meeting of the R.I.B.A. Architectural Science Board on 14 October 1947, Mr. R. N. Wakelin [*A*] in the Chair

THE LECTURE is going to cover quite a large field. Not so large, however, as it might, for I am going to simplify matters for myself—and I hope I shall not disappoint you—by limiting it to the consideration of sources of strictly *technical* information. In other words, I am going to omit all consideration of Acts of Parliament and the various Regulations and Orders that govern us and about which there can be few more ignorant than I.

Allied with the problem of securing technical information there is another one: how to keep it when you have it. What sort of system are we to use to enable us to turn up those facts once known and now forgotten, or to trace that dimly-remembered advertising leaflet? There are almost as many ideas about this as there are architects' offices and I cannot promise any solution, but the problem is very clearly affected by the form in which the information is presented to us, so I shall have occasion to refer to it from time to time.

I have classified the various possible sources of information like this: the technical press, books published commercially, trade associations, the Department of Scientific and Industrial Research, publications of Ministries, the British Standards Institution, the Royal Institute of British Architects, and, finally, 'other sources'.

The technical press is one of the essentials for a living architectural profession (I am not sure that we have all the others). Nothing can take the place of the technical press in giving us details of current architecture, events, and publications. To read one of the architectural papers is the very least we can do to keep abreast of things and I suppose that there are few architects who don't do it. I personally find that book reviews and abstracts are one of the most useful features, and the increased space that has been given to them in recent years shows, I think, that both the Press and its readers realize this. In these days of paper shortage you have to make up your mind pretty quickly if you want a book and a good review is almost the only thing that can help you. I know some reviews don't tell you much except the state of mind of the reviewer—then you must look elsewhere.

Advertisements are perhaps the most criticized part of our journals, and anyone may be forgiven for irritation at the crude drawings, chaos of type faces, and the schoolboy humour that only too often affront our eyes and minds; but unfortunately it is necessary to look through the advertisement pages. Not that you are likely to get much technical information from them, but you may see something which will induce you to write for further particulars and as a result of that you may get something really useful. The idea has just crossed my mind that if all advertisements were restricted to one-quarter page we should save a great deal of paper and I doubt whether many advertisers would find themselves unduly restricted.

In my opinion the main defect of the technical press is its lack of the critical faculty. I don't mean that it accepts the advertisements of inferior products, but that there is not enough writing *about* buildings, methods, and materials. We may feel that we can perfectly well make up our own minds about the qualities of a new building but it would nevertheless be interesting to know the opinion of a critic we respect—or even of one we don't respect. We feel this even more in the field of planning because there can be very few who can form a confident opinion of the merits of a new town plan from the illustrations in the architectural press—he'll probably have to be pretty keen-sighted to read the plans at all. And my complaint is that rarely will the accompanying text be any help to him.

I should like, too, to see more discussion among architects in the papers. I suppose it is partly lack of time that prevents it and partly notions of etiquette. But in Czechoslovakia, for instance, when an important site is to be developed, it is quite common for a number of different schemes to be published over several years. They are keenly discussed among architects and I am sure that this procedure is good for the final building and good for architecture. Of course, we talk about architecture and building when we meet, but we meet only a limited circle—and mostly Londoners at that.

Finally, I should like to point out the interest that is often to be obtained from non-architectural journals—those of the surveying and engineering professions, for instance. Not many of us can be regular readers of them, but it is well worth while looking at any technical but non-architectural paper when you have a chance. Only this week I saw in the official review of the National Register of Electrical Installation Contractors, the explanation of a defect in a hot water service in one of my houses which had previously beaten me and which had beaten the installation contractors as well.

Many architects cut up their journals after they have read them and file the cuttings for reference. The cutting, however, is a tedious process and must be done by a responsible person, while I have found that to do it properly one really needs two copies of each journal so that both sides of a page can be filed separately if necessary. I have now come to the conclusion that the best course is to save all the journals and at the end of the year have them bound—less the advertisements. This is cheap, saves a great deal of trouble, and information cannot get lost. A slightly cheaper way would be to keep them in box files, but with the present price of box files it wouldn't be much cheaper.

There can be few branches of architecture and building that have not their appropriate text books. I think structural engineering is perhaps the side that is best served; there are a number of excellent elementary books suited to the comprehension of architects. The side worst served, as I think most will agree, is ordinary building construction. Most books on this subject have excellent material in them, but they have also a great deal of old-fashioned detail. To some extent this is in the nature of things and the ideal building construction book, that would contain the solution to all our problems, is an impossibility. A constructional drawing always shows the solution of some particular problem, and it is almost certain that our own particular problem—especially while our architecture is changing as it is—will be different in some respects.

That is why the publication before the war of *The Principles of Modern Building*—or rather its first volume—was such an important event. It is only a grasp of principles that will enable us to deal adequately with every difficulty that arises. Most architects learn these principles not at school but in the course of their practice, and the virtue of such a book as that of Mr. Fitzmaurice is that it assembles and co-ordinates the results of a larger body of experience than any single practice is likely to have. I hope that this book will not be like that other publication, *The Theory and Elements of Architecture*, by Atkinson and Bagenal (which I wore to bits when I was a student), of which Volume 1, Part 1 was published in 1926; for I am afraid we shall never see Volume 1, Part 2, let alone Volumes 2 and 3.

There are two other books that I must mention by name because there is really nothing else like them. I mean *The Information Book* and *Specification*. THE ARCHITECTS' JOURNAL recently published some astonishing figures about the circulation of their information sheets which show how well this publication fitted in with the requirements of architects. There can be few offices that have no copy of *The Information Book*, and there can be few where it does not show signs of constant use.

Personally, I have found the later Information Sheets less useful on the whole. It is quite natural that the information needed most should have been given first, but I feel that later there was some tendency to try to express graphically things that could have been more conveniently expressed as reading matter.

Specification is equally valuable, but the part of it that I never use is the specification clauses. What I value most is its survey of each trade in a really up-to-date way and the condensed but well considered information that it gives on proprietary products. When paper restrictions are removed the

problem, I imagine, will be to keep this publication to a reasonable size.

Among the available text books there is very great variation of quality. It is fairly easy to play safe by sticking to authors you know or the old-established and well-known publishers, but there is certainly room for some of the newer ones, who are more likely to search for new ideas and new writers. I can think of several architects who could write ideal textbooks—but of course they are busy doing other things.

The R.I.B.A. Professional Text and Reference Books Committee is doing an important job here, in advising writers and publishers on the needs of the profession. There are a number of gaps to be filled. One of the gaps is, I think, in connection with materials, and here the various trade associations, development associations, research associations, can play a part. Most of them were unable to undertake much work during the war but they are now becoming active again and any architect who wants information about a specific material would be well advised to get in touch with the appropriate development association if there is one.

The Aluminium Development Association will answer any enquiries from architects on the use of aluminium. They have a number of very good pamphlets, giving technical information, and films.

The British Gas Council represents the gas supply undertakings, carries out research, and issues useful publications.

The publications of the Coal Utilization Joint Council are probably familiar to most architects. Research is undertaken by the British Coal Utilization Research Association.

The Cement and Concrete Association has a very good library and a large collection of catalogues relating to something like a thousand firms. They have many publications and a Research Department.

The Clay Products Technical Bureau have not yet found it possible to resume their pre-war activities on the pre-war scale, but they will soon have available some reprints of their useful Information Sheets from THE ARCHITECTS' JOURNAL.

The Copper Development Association has some excellent booklets, answers enquiries, and gives practical demonstrations, lectures, and film shows.

The main activities of the Electrical Development Association lie in the direction of publicity, but a number of their publications are of interest to architects.

The Lead Technical Information Bureau has issued some especially good pamphlets, which are always topical, in the sense that they deal with the sort of building we are doing now, and practical.

The Timber Development Association is perhaps closer to architects than any other, and the mere mention of its name evokes a certain nostalgia. Its publications are well known and in some cases design work can be undertaken by them. It is hoped at the end of the year to commence the circulation of bulletins on constructional research and of sheets of standard designs. They have carried out a number of designs for architects, and they intend to produce standard sheets from these which will be available.

Many of the publications of the Zinc Development Association are on the uses of zinc in engineering, but there is a great deal of very well-produced data that will interest the architect.

These bodies are naturally concerned mainly with their own particular material and the architect must often make a choice between several. One certainly cannot blame anyone for pushing his own product and all we as architects ask, really, is that we shall be given scientifically ascertained facts in a clear form. There have recently been some attempts to administer the facts at cocktail parties; but I haven't found that information and alcohol mix well and I dislike to think my clients must ultimately pay for my entertainment.

It is clear that the all-round view requires complete independence and I think we are most likely to get it from the Building Research Station, which is certainly the most important technical organization and perhaps the most important force for progress in the building industry. We can look to the Station for help on all problems connected with structure and materials and on many of the problems of planning too. Enquiries by letter or telephone are answered—though one sometimes feels that the advice is a little cautious. The Station will at times make special investigations if they seem worth while to their work as a whole and they may send an officer down to study a problem on the site.

Most architects, however, will know the Station through its publications. I have already mentioned *The Principles of Modern Building*, which differs from most of the others—the special reports, technical papers and bulletins—in that they usually cover a narrower field and are the result of some particular investigation or series of investigations. It is a pity that a number of them are out of print at present.

On the other hand, the series of *Questions and Answers*, which used to be published in the technical press, is to be resumed. The Building Science Abstracts, which are still published, cover too wide a field, in my opinion, for most architects. I understand that the possibility of preparing a special version for architects has been considered but does not seem practical. All the publications of the Station are listed, together with all publications of the Department of Scientific and Industrial Research, in Sectional List No. 3, which is obtainable from the Stationery Office. Anyone who wants to keep in touch with what the Station is doing should get the Annual Reports, which are always interesting reading.

The Forest Products Research Laboratory has a number of extremely useful publications, the titles of which are obtainable from the Laboratory. But probably the service which is of most use to architects is the analysis of samples of decayed timber. I have used this many times—you send the sample and you get more or less by return post information as to the type of decay.

In considering the various Ministries I shall deal only with their publications. It is possible to get information from them by telephone or letter but one would hesitate to recommend it.

First place must go to the Ministry of Works because, in spite of all its faults, it has done a great deal for us and for building. An effort has been made to treat building technique in a rational way and the Post-War Building Studies are certainly the first such enterprise that has been attempted in this country and I doubt whether it has been done in any other. They assemble the opinion of some of the foremost experts in those branches of building which are of greatest importance for us now. Some of their recommendations have even been acted on, with very beneficial results. This series is so important that I think it worth while to mention some of the individual reports.

The first, *House Construction*, is absolutely fundamental. It defines basic technical considerations in house construction and suggests standards. In addition it has very valuable information on materials, including some of the newer ones.

No. 2, *Standard Construction for Schools*, is very brief and does little more than suggest the main dimensions for standardized structural framework. These have since been adopted by manufacturers and I have seen the opinion—put forward by Mr. Birkin Haward in an article in KEYSTONE—that it is unfortunate that dimensions which were merely suggestions have been translated into rather too rigid facts and that further investigations might have shown that slightly different sizes were preferable.

The third study is a comprehensive account of plastics and has the merit that it does not over-stress their virtues or possible future applications in building. There is nothing about the all-plastic house of the future, for instance. The fourth, on plumbing, has useful diagrams and interesting information on the one-pipe system which, however, the writers do not appear to favour greatly. The fifth study, on painting, is one that I have found very useful myself, though those who know more about painting than I do—and they must be very many—might not need it.

Mechanical Installations, the ninth report, has a good deal of information on subjects about which we tend to be ignorant—for instance, lifts, escalators, wells and pumps, and large refrigerator equipment. The next study deals with a subject—solid fuel installations—of which we have probably all absorbed the elements. During the coming winter its importance will no doubt be emphasized again—on our shivering bodies. This study should be taken in conjunction with No. 19, *Heating and Ventilation of Dwellings*—The Egerton Report—which covers much more ground very thoroughly indeed and is certainly the more valuable of the two.

Study No. 11, *Electrical Installations*, is noteworthy for its suggestions for the simplification of wiring in dwellings—suggestions which I have found in practice do have advantages and with which I think the housewife will be pleased.

The Lighting of Buildings is one of the very best studies. It assembles the relevant

data on design for sunlight, daylight, and artificial light, and suggests standards for dwellings and schools. There can be few architects who can afford to do without this report.

No. 13, *Non-Ferrous Metals*, is very useful for reference, giving a good deal of information that it might be difficult to turn up readily elsewhere. So is No. 14, on *Sound Insulation and Acoustics*. In my view the section on acoustics is less useful than that on sound insulation, especially as it deals with types of buildings of which very few are being erected now.

No. 16, on *Business Buildings*, is so general that I doubt whether it will be of much real use to anyone. I may be prejudiced against it because it makes use of a system of numbering paragraphs by which each paragraph requires at least three numbers to identify it—very annoying to anyone who is trying to make an index. This system is carried still farther in the Egerton Report, where a paragraph may require four numbers to identify it and sometimes a letter as well. Actually, in this latter report, the editors have shrunk from the full consequences of their system, because you sometimes get as many as six consecutive paragraphs without any number at all. I have been unable to find any benefit for the reader in this system.

The 17th study, on *Farm Buildings*, is a very thorough production with clear drawings which would, I should think, be invaluable to those concerned with this subject. No. 18, *The Architectural Uses of Building Materials*, is better than its title and I think most architects are likely to find useful information in it.

The report on *Fire Grading of Buildings*, of which only Part 1 has been published so far, is evidently going to be a pretty big affair; fire fighting equipment, means of escape, and chimneys and flues have still to be considered. It will certainly be the most thorough consideration of this rather specialized subject that has ever appeared.

The second report on *House Construction*, *No.* 23, contains interesting evaluations of eight different systems of prefabricated construction for dwellings. I imagine that the number of architects designing prefabricated houses has suffered a considerable fall in recent months, so this study is likely to be interesting rather than useful in its description of the pitfalls that await the designer.

There are a number of publications of the Ministry of Works on organizational aspects of the building industry, starting with the *Simon Report*, *The Placing and Management of Building Contracts*, and including *Programme and Progress*, *Progress Charts for Housing Contracts*, and *Production in Building and Civil Engineering*. There is a good deal of important information in these and I should like to see more on similar subjects. After all, unless our industry can be run efficiently, our technical advances may easily be nullified or we may never get a chance to try them out in practice.

All the publications of the Ministry of Works are listed in Sectional List No. 30.

The HOUSING MANUAL is another official publication which one can't afford to be without. It is unfortunate that the plans in it are now out of date owing to the increase in the allowable area and the recommendation by the Ministry of Health to provide two W.C.s—a recommendation which may sometimes open new possibilities in planning the first floor as it is no longer necessary to provide a W.C. separate from the bathroom. It would be interesting to compare plans prepared under the new regulations with those now in the manual, which are not, I am afraid, very brilliant. I have found some of the technical appendices—for instance, those on lightweight concrete and timber economy—very useful.

Ministry of Health publications—like the *Dudley Report*, which is the best and most readable—are valuable not so much as sources of technical information, but to give the background of the housing problem. In a somewhat similar category come the Ministry of Health circulars to local authorities. It is impossible to read them all, but it is worth watching the technical press for details of them.

The next of my sections is on the British Standards Institution. Not many architects will aspire to possess a complete set of the standards relating to building, but it really isn't necessary while we have *B.S. Handbook No.* 3 and its supplement. These give condensed versions of all the building standards, in many instances with illustrations, and I have always found them perfectly adequate.

Then there is the *Code of Functional Requirements of Buildings*, which is not yet in its final form. It is published as a series of separate chapters and some of them contain valuable information. Those I have found most useful are chapter 7, on *Services*, which gives information on sanitary provisions, water consumption and the like, which it is sometimes difficult to find elsewhere, and chapter 8 on *Heating and Heat Insulation*, which contains a rather terrifying chart for estimating the desirable amount of insulation, taking into account such factors as climatic conditions, exposure, continuity of heating, and cost of fuel and heating plant.

The other great undertaking of the Institution is the *General Series of Codes for Building Practice*. I am doubtful of the utility of these as a whole. It seems that there may be as many as a hundred separate parts and those that have been issued vary greatly in quality. I can't see that many architects are going to acquire them all, or that it would be worth their while to do so. Moreover, they are very expensive and I find that the price of the 50 or so parts I have is about £6.

Next we come to our own Institute. What sort of service can the R.I.B.A. give to those of its members in search of information? In the main the day-to-day service is given through the Library and I understand that the scope of the enquiries it receives is very wide. It is rather hard to draw the line between what it is legitimate to ask of the Library and what it is not. The most narrow view would restrict the service to answering enquiries about publications, in practice the Library attempts—though perhaps reluctantly—to answer an enormous range of questions on any subjects related, even distantly, to the practice or history of building.

It is worth while to learn to use the Library catalogue, so that you don't bother the staff so often, and to subscribe to the LIBRARY BULLETIN which gives information on all accessions and a good idea of what books and magazines are worth looking at.

The Library is invaluable for information on specific building types and current architecture. Articles in periodicals are indexed and bibliographies are available on a number of subjects.

The R.I.B.A. JOURNAL seems to me the best of the technical papers if you want serious information. It's true you won't find gossip there, and such social notes as it does have read rather like a Court Circular; but if you want a carefully thought-out article by an authority you are more likely to see it there than in any other journal. I have found it quite impossible to cut up and file this paper; I take advantage of the very cheap paper-bound volumes that are available every year. The lectures we have here are usually published in it, and though it is good to attend if you can manage it, it is also good to have them in a permanent form.

The exhibitions held at the R.I.B.A. are, of course, one of the best means of keeping abreast of what is happening abroad. I have heard it suggested that we should have more shows of English work, but in fact the technical press gives us that fairly well and I think most people will agree that one can learn more from seeing what has been done elsewhere.

Another important source of information is the Building Centre, though to me it seems less useful than it used to be. I find that I visit it occasionally to see whether there is anything new, but more often I telephone to find out, for instance, names of makers of some particular material I'm interested in. I wish one could get advice from them on the relative merits of different materials, or of the different makers of the same material.

I don't know how much architects visit the Housing Centre, but everyone ought to know that it has a bookstall with an unequalled selection of books on housing and planning.

Now if we try to draw the threads together we shall probably feel that we have a pretty tangled skein in our hands. Is it really possible to organize oneself so that all the information is at once accessible, so that we know where to look, and so that, without too great an expenditure of time, we keep it up to date? As things are at present, I doubt it.

One of the first things to be done is to educate the manufacturers of building materials and components. It really is appalling to think of the amount of paper that is wasted every year in trying to catch the attention of architects with stuff that in fact prejudices most of them against the product. I believe that most manufacturers

have a touching faith in the abilities of their salesmen. They believe that if a salesman can get his hooks on you he will land an order. And so the purpose of their advertisements is not to give you information, but to induce you to ask a representative to call. I am sure they are quite mistaken. What we want is clear factual information about sizes and performance, and it would be of great advantage if we could get it on sheets of one standard size. This would be a good beginning.

One of the most difficult problems, of course, is the means of filing and indexing such information. At our office we have a system by which we put leaflets into box files, labelled with such titles as: Doors, Partitions, Heating, Paint. One difficulty is that one can't avoid a certain amount of overlapping. Another is that the files eventually become enormously overfull. One should really keep throwing out out-of-date leaflets but the task is such that the spirit quails before it. The same difficulties apply to the filing of cuttings from journals.

I came across an interesting idea the other day in a new French publication called *Construire la France*—issued by the Union of Engineers, Architects and Building Technicians. This is a periodical and each page is numbered consecutively in the ordinary way, but each has also another number according to the subject of which it treats. The first digit denotes the main subdivision —for instance, economics, materials, reconstruction, or bibliography—and other digits indicate various subdivisions like the system of decimal classification in a library. The pages are easily detached and are ready punched for filing, so that successive issues will gradually build up into volumes which should make for very easy reference. This doesn't solve all the problems but it seems to me an idea well worth trying.

Perhaps I should, before concluding, try to give my idea of a minimum reference library for an architect's office. I think it might consist of the following: First, the *Post-War Building Studies*, which are so cheap that it is worth getting the lot, though if I had to economize what I have already said will indicate what I should omit. Second, the *Housing Manual* and half-a-dozen or so other publications of the Ministries of Health and Works. Then *B.S. Handbook No.* 3 and the supplement, together, perhaps, with the *Code of Functional Requirements of Buildings*. In addition you will want *The Information Book* and *Specification* and, I think, one of those useful reference books that give you all sorts of formulae, weights of material, weights and measures, how many cubic feet in a standard and so on. I manage with the *A.B.T. Diary*, but you can get something bigger if you like. Among textbooks I find I need one on building construction, a fairly elementary book on steelwork and reinforced concrete, and Fitzmaurice's *Principles of Modern Building*. Lastly, I have the bound copies of the R.I.B.A. JOURNAL and it is worth while getting one other journal if only for the sake of the current architecture.

In addition to this you will have to have some sort of system for filing advertisements and the other pieces of technical information that one accumulates. If you can keep it tidy and up to date you will indeed be fortunate.

We cannot hope to have in the office all we need and we must get information from outside sources. Sometimes the trade can supply what we want, but if not, our difficulties begin. The idea of a central information bureau where we could call, 'phone or write is a tremendously attractive one and has been discussed before. The difficulty is that it would obviously be expensive and could in my opinion be run only by the Government. It would have to have not only a large library, but specialists on materials, construction, heating, lighting, drainage, etc., and a complete range of building materials with data on their performance—and some of the data might have to be obtained against the wishes of the manufacturer! Clearly this is only a dream at present. It would not be worth applying such a high degree of organization to one section of the industry when the greater efficiency thus obtained could be so easily nullified by other factors which were beyond control.

The best technical information demands an efficient industry in which to use it.

DISCUSSION

Mr. Guy North [*F*] said that Mr. Penn had referred to the accompanying press matter in plans and illustrations as being very poor. That was certainly true, and, even when it was not, it was often very difficult to find the information that one wanted. He himself felt continually that it would be extremely useful if the architect were always presented at the beginning of an article, or even of a book, with a really skilled précis. It might be objected that that would be dangerous, in that the architect would tend to rely on the précis and not bother to read the subject-matter properly, but if he did he would be asking for the trouble that he would certainly get. Such a précis would be very useful for quick reference.

He was surprised that Mr. Penn was not more enthusiastic about the Codes of Practice, because so far as he had seen the drafts he thought that they formed a useful condensation, if not a précis, of the whole of the general practice of an architect, and he would have thought that they would be very valuable. He agreed that the cost, £6, was a snag. The British Standard Specifications and the Codes of Practice were all rather high in price, if one were faced with buying them all; but, leaving on one side that merely mercenary question, the Codes of Practice seemed to him to offer enormous assistance to architects. There were many countries in the world, such as Canada and Czechoslovakia, in which they were well established on a national basis. Mr. Penn might be interested to know that the B.S.I. had issued a British Standard Specification with the object of trying to standardize manufacturers' catalogues in size and content. The committee which drew up that standard had been instigated by the R.I.B.A. That was a small move in the right direction.

He would like to suggest that the most valuable thing which architects could have —and perhaps the R.I.B.A. was the right body to provide it—would be an index of sources of information.

Mr. Penn said the idea of giving a précis at the beginning of books was a good one, and in many cases such a précis should be quite useful. In most Government reports something of that kind was done, in that there was a summary of recommendations at the end. It was something which writers of books might well bear in mind.

He had been a little afraid that he might have given too unfriendly an impression of the Codes of Practice. He had said that the quality of them was uneven, and he thought that some were in fact extraordinarily good. There were so many of them, however, that one would have to look at them in the R.I.B.A. Library or elsewhere to decide what one wanted.

Mr. Denzil B. Nield [*A*] endorsed what the lecturer had said regarding text-books. Those who were concerned with teaching, he said, realized the enormous deficiency which existed at present. How it could be remedied he did not know; apparently it took several years to write a good textbook. It could not be done by getting different people to write different chapters dealing with various trades or sections, because they were never properly co-ordinated, and the result was a book which was a series of 'chunks,' sometimes very unsound and unreliable.

He wished particularly to mention the work of Study Group No. 2 of the Architectural Science Board, which was concerned with building technique and the dissemination of the information to architects. They had been considering the question of information for architects for some time, and were particularly interested in the discussion that evening because they hoped to obtain valuable suggestions which would help them in their work.

It might be of interest to mention some of the points with which they had been dealing. One was why the results of research were not being used as much as they might be. Taking thermal insulation as a case in point, a great deal of very valuable information on the subject had been made known some years ago, and yet it was not being carried out in modern buildings to anything like the extent which it might be. They wanted to conduct a little inquiry to find out the reason—whether it was that architects did not know about it, that it had not got through to them, or whether they knew about it but could not be bothered, whether it was thought to be too expensive to adopt, or whether there was opposition from local authorities which could not be overcome. In some cases, perhaps, architects had misunderstood the information and tried to do things in a wrong way. They did not know why the information which was available was not more used, and they would be very glad to have suggestions on that subject.

Another matter which worried them was

that a great deal of information came from very sound sources, but was not in a form which made it easy for the architect to put it quickly into practice and translate into specification clauses. They were going into that fairly thoroughly, and considering suggestions such as having specimen specification clauses, rather like those in the book *Specification*. That, however, had its drawbacks. Much of the information was given out in the form of principles. Mr. Colin Penn, for example, had mentioned the excellent book by Mr. Fitzmaurice on *Principles of Modern Building*. That was the way in which information should be given; if one had tight specification clauses they could easily be too rigid. There was room, however, for translating the Codes of Practice into a form which would make them more easily used by architects.

Information services for the use of architects were being considered, but it did not seem that very much could be done by the R.I.B.A., as the cost would be prohibitive. There might be other ways, however, of expanding existing information services, and any suggestions on that subject would be useful and would be considered by his committee.

Mr. A. J. Newton [*A*] said he had been very glad to hear that there was a plan on foot to standardize the size of catalogues, because one of the architect's difficulties was to have some ready means of reference to new materials and processes, and in the absence of this they tended not to use the new materials which were available, but to continue to employ those traditional forms of material with which they had grown up and in which they had been educated at their architectural schools. If such a standardization as had been suggested could be carried out it should go a long way towards promoting the effective use of the many modern materials available.

Mr. A. B. Agard Evans (Librarian, Ministry of Works) said that they had a library at the Ministry of Works at Lambeth Bridge House, and any architects who cared to make use of their records could do so quite freely. In the last two years they had started small reference libraries in each of the Regions, and in some district offices. They could not hope to do their own subject index, and so they provided them fortnight by fortnight with batches of subject index cards covering the book and pamphlet material and the articles in periodicals dealing with the whole field of building and even going a little wider than that. In each Region, therefore, there was that fairly comprehensive though modern index of material which he thought covered the field of architecture fairly completely. Those indexes were available to any architects who cared to make use of them, and architects could also make use of the information service, giving information on recorded facts, through the Regional librarian.

For the last two years or so they had been trying at Lambeth Bridge House to make a complete collection of trade catalogues on building material. They had had to exclude samples, and the collection was not, of course, absolutely complete, because of printing and publication difficulties; but it was fairly complete, and it was in charge of an architect, Mr. Phillips, who boiled down the contents of the manufacturers' claims on a card index. That was also available to any architects who cared to make use of it, but, since the library and the catalogue service were primarily for the use of the very many architects, engineers and other technical officers of the Ministry, it would not be possible to extend the loan service to architects generally. Anyone who cared to call in to see them, however, was welcome to do so, and anyone who cared to ask by telephone such questions as who made such-and-such a thing could have the information. The Ministry could not be discriminatory, because it had to be completely unbiassed.

Mr. F. M. Jones [*A*] said that since coming back to England he had been astonished, in looking at local libraries in different parts of the country, at the very low standard of the technical works on building and allied industries found in them. He wondered whether there was any sort of organization or method in the country by which local librarians could receive advice on the type of work which was really required for the different scientific and professional interests. So far as the building industry was concerned, if one went into a reference library one would find quite a large number of works, but either they were too abstruse for an architect to get from them quickly the information which he required or they were very out of date. Even when they were up to date, they usually conveyed the information in an unsuitable way. He was wondering, therefore, whether it was possible for the Royal Institute, or for any other organization in the library world, to give some sort of lead on the type of book which would be most acceptable to architects, quantity surveyors and others.

He would like to ask whether Mr. Penn had considered the manner in which information was given in the different technical publications and in the more scientific publications of the Building Research Station, and so on. Personally, he had found that many people were very interested in the information imparted, but did not seem to feel that it was something which applied in everyday life, something which they themselves could use from day to day.

As an example of the sort of thing that went on, an excellent report had been brought out on external finishes by the Building Research Station and was published in the JOURNAL of the R.I.B.A.

Mr. G. B. Oddie [*A*] suggested that one of the reasons why sources of technical information available to architects fell so far short of what was desirable both in accuracy and in the actual material presented was that architects themselves did not demand a sufficiently high standard of accuracy or a sufficiently scientific method of presentation. There was a great tendency among architects—even those who sneered at science less than many others—to regard it as something which should arouse suspicion. He thought that that was because they still imagined that some day or other they would be able to get back to the old methods of building where it was possible to rely on rule-of-thumb methods for design and construction, and so they thought they did not need to bother about the basic elements of construction and design.

Mr. Vivian Levett said that there was one rather small but very fundamental question which had interested him for the past few years, the question of the classification and indexing of information. Mr. Penn had mentioned that in his talk, and recently the ARCHITECTS' JOURNAL had devised a wonderful scheme for classifying the information sheets which it had just begun to publish again. During the past few years he had been very interested in the Universal Decimal Classification system, and it seemed to him that in that system there was already a very complete and really universal system which would help architects to keep in order the colossal amount of paper which they collected.

Mr. Penn, in reply, said that he had been very interested to hear what Mr. Agard Evans had to say about the Ministry of Works Library. He did know that such a library existed, but he had not known that it was possible for anyone outside the Ministry to consult it. It seemed to him that that could be very useful indeed, while the establishment of libraries in various Regions seemed to be a very progressive and useful step.

It had been suggested that architects were not scientific enough, and that their digestion could not quite absorb some of the information issued to them. He thought that to a considerable extent that was true, and it was a fault which architects would no doubt overcome.

The Codes of Practice had been defended in the discussion, and he thought successfully, but a number of speakers had raised the question of what could be done to see that the information provided was put into practice and that the results of research were used. With the talk on all sides of cutting down the building industry, the prospect was obviously black; but in any case he felt that there was a very big responsibility resting on architects to see that use was made in their industry of the scientific advances which had taken place. He believed, as he was sure all his hearers did, that science could help in developing better methods of building, and it was up to them to push for the employment of those methods. He knew that what they could do was limited, but he felt that they did not always do as much as could be done, and that they had to dig their heels in and say, 'It is possible to do these things in a better way, and we are going to do our utmost to see that that better way is adopted.'

Address to the R.I.B.A. Council

By A. J. van der Steur

President of the Board of the Association of Architects of the Netherlands. On 14 October 1947

DEAR MR. PRESIDENT, dear colleagues: I feel myself very much honoured. The Institute of which I am a guest at this moment seems a most illustrious institution, and the humble and relatively much smaller association which I represent here, looks upon you and your achievements in the field of the organization of architects, the establishments of their codes and rights, the registration and the protection of their title and profession as an example to be followed—if not always in the method we have to adopt, at least (and that, to my mind, is more important) in the spirit that should move our actions.

But, Mr. President, before I enlarge upon this, there is one thing which I have to say first of all as a Dutchman to an assembly of Britishers, and not especially as a Dutch architect to British architects. It is this: that to my mind and I am convinced to the minds of all our compatriots who take the time to think and are able to think it is a common thought, that our country owes its re-establishment as a free country to our allied friends, but first and foremost to you British. We will never forget that in the dark days of 1940 when in Europe everything seemed to be broken down and overrun by a terrible enemy who seemed to be absolutely invincible, it was Britain that held out, fighting with its back against the wall, fighting a fight which seemed hopeless, only sustained by the firm belief that in the end a good cause must win against a bad one. If I say that we owe our freedom first and foremost to your country, I mean that not only as a question of military force, I mean it principally in this sense, that in the period when we were feeling absolutely dazed by a terrible defeat which robbed us of our freedom, it was the voice of Britain which told us to hold out, it was the voice of Britain which made us hope again, which made us realize the possibility and the necessity of resistance. I presume it is not for the first time you hear this from us, but I feel it can never be said often enough. And I can tell you that it has made us realize more distinctly than ever before the ties that unite our countries and our peoples. As I am speaking to you today in this place, take everything I say in this spirit—I can assure you it is not a hollow politeness, but that it comes from the very bottom of my heart.

Dear Mr. President and dear colleagues: I do not know exactly the age of your institute, but I think I am not far wrong in presuming that it has already passed its centenary. So has our association which was founded in its original form (the Maatschappij Voor Bevordering van de Bouwkunst) in 1842. We could not celebrate this centenary because at that moment our Association seemed dead: overcome by the collaborators of the enemy, its board in July 1941 was sent away and replaced by a commissary who took only two or three measures to make it abundantly clear to us that we had to leave the Association as soon as possible, which we did. At the instigation of the Board which had been dismissed, but which still knew how to find ways to reach the members, more than 90 per cent of the members resigned, leaving the so-called commissary with an empty shell. From that moment till the day when, in the beginning of May 1945, we were able to take over again, our Association has been a dead thing, only fit to be robbed of its possessions—which it was.

During this four-year period of occupation the work of our Association went on more or less underground. Groups and commissions sprang up everywhere, which met privately in our own houses, often with the secret or even only half-secret collaboration of official persons. The study of the architectural and social problems of post-war housing was one of the most important of these groupings; it is still continuing its work, now out in the open, and as an official organ of our association, is in close touch with the Ministry of Reconstruction, and often fighting with it, but recognized as the voice of the architects in matters of town planning and housing. The studies of these groups have done much towards the establishment of the standards of dwelling space for post-war housing which are now generally and officially recognized in our country.

There were two other important things we studied amongst ourselves in war-time. First was the question of the protection of the architect's title and profession, second was the question of the architectural association in relation to this protection.

As to protection of the title I think we cannot teach you very much, rather do we owe much to you the system we have developed—and which was already laid down in a project of law which was temporarily abandoned in May 1940, when our government had to leave the country, and which resembles the English law on this point very closely. When the war ended we could go to our Minister of Education and tell him: 'Your Excellency: this project of law seems to be all right to us, only our opinion is that the protection of the architect's title is not sufficient. What we need, and what we consider to be a necessity from now on, is the protection of the profession, meaning that only a registered architect shall be entitled to submit building plans to the authorities to get a building licence'.

Our government has agreed to our suggestions and, while our Association has, as a preliminary to official registration, already set up a private registration of its own following the lines of the project of law mentioned before, it has in the Queen's speech at the opening of Parliament on the 16 September last announced the bringing into Parliament of a law governing the protection of the architect's title and profession. This is the first time in our history that government has done anything or even announced any intention on that score. If the political conditions in our country will allow this government to remain sitting another year (which is, by the way, far from sure) we shall see at last, after a gradual development of more than 21 years, a further step on the road to a legally protected position of the architect in our country.

The second important point we gave thought to is architectural education in relation to the protected profession. We feel very strongly that we should only be allowed to act as architects if we comply with a certain standard of ability, and the necessary complement to this limitation must be the creation of schools all over the country where those who have the talent can develop their abilities so as to reach the standard required. I fear I will take too much of your time if I go into this important point with you today. I am invited to the celebration of the centenary of your Architectural Association next December and perhaps I shall be able to inform those of you who are interested in the details of the way we are trying to put this into practice. It is sufficient today to tell you that we are just now bringing the reports we worked out during the war and which we submitted to our Minister of Education very soon after the liberation, into practice, founding these schools on a law which was originally not at all intended to rule the architect's education, but rather the education of artisans and higher technicians of all kinds. Awaiting the setting up of laws to govern architectural education specifically, this older law appeared to be adaptable to our uses, so that the necessary financial support of the government could be obtained; that has in a number of cases already been assured. It is a system which we are keeping strictly in hand ourselves, so as to be sure that this education, which is of a fundamental nature for the architectural development of our country, will be built up in the right spirit.

Mr. President, dear colleagues, I fear I have already taken up more of your time than you originally intended me to have. For this I hope you will accept my excuses. I have been very glad to be able to attend this friendly gathering, to enjoy your very kind hospitality and to be able to tell you something specific about the conditions under which your sister institution in our country lives and works. I hope my words will have aroused your interest. Consider me as your very affectionate friend.

Review of Construction and Materials

This section gives technical and general information. The following bodies deal with specialized branches of research and will willingly answer inquiries.
The Director, The Building Research Station, Garston, near Watford, Herts.
Telephone: Garston 2246.
The Director, The Forest Products Research Laboratory, Princes Risborough, Bucks.
Telephone: Princes Risborough 101.
The Director, The British Standards Institution, 28 Victoria Street, Westminster, S.W.1.
Telephone: Abbey 3333.
The Director, The Building Centre, 9 Conduit Street, W.1. Telephone: Mayfair 8641-46.

Timber Development Association. As in the case of many other values, former ideas about the comparative proportions of cost of materials and labour must be revised in view of present conditions; that of materials has gone up so much that a little extra labour on certain items is of much less importance than it used to be. Bearing this in mind, the Timber Development Association have designed a construction for roofs that will call for the use of less timber than formerly, although it may require a little extra labour on the joints. A full-size model has been erected for test purposes at the Forest Products Research Laboratory, Princes Risborough, and may be inspected by interested persons. It is hoped to publish a detailed description in a subsequent issue of the JOURNAL.

Electro-osmosis. The application of electro-osmosis to practical problems in foundations and earthworks sounds a somewhat formidable subject, but when it is explained that it is a method of keeping water out of excavations, furrowed brows will relax. It is a problem that mainly confronts the civil engineer, but there are aspects of interest to architects, who may well spend 9*d.* in buying *D.S.I.R. Building Research Technical Paper* No. 30, issued at H.M. Stationery Office. In ordinary deep excavations in fine-grained waterlogged soils the contained water runs out of the sides of the excavations, which may slip, and in saturated soil there is a tendency for the bottom of the excavations to lift. Electro-osmosis consists in driving electrodes into the ground and charging them respectively with positive and negative electricity, which induces a forced flow of water from the anode to the cathode electrodes, and if the cathode be designed as a drainage well, the water in the soil will flow to it and can be pumped away. The procedure is to drive a series of negative wells along the sides of the cutting, with a row of positive electrodes between them, so that the normal flow of water towards the sides of the cutting is reversed, and the direction becomes from the excavation face towards the negative draining wells. This method was first investigated in Germany in 1936, but since 1939 it has been applied successfully on a number of sites, and laboratory investigations are now being carried out at the Building Research Station, who will in due course present a further report. The present report has been prepared by Dr. L. Casagrande, the originator of the method. The report says that 'The facts that silt soils, including the various kinds of loess, are very prevalent, and that these types of soil often cause great difficulties and surprise in practice, lead to the conclusion that electro-osmosis, in spite of the fact that at present practical experience of its use is limited, will as time goes on gain in importance'.

A number of tests on models have been carried out, but large-scale tests have also been undertaken; for instance, in the case of a railway cutting near Salzgitter, in a loess-loam soil, the construction of the slopes was impossible, even in dry weather, although the maximum depth was only 7 m., but the high level of the ground water caused the soft soil to flow out when the depth of the cutting was barely 2 m. In this case 10 well electrodes, each 7.5 m. long and 10 cm. diameter, were spaced at intervals of 10 m. along the top of the stretch to be tested and on both sides of the cutting. Positive electrodes, in the form of gas piping 7.5 m. long and 1 cm. diameter, were driven between the well-electrodes. D.C. current at 180 volts and an average of 19 amps. was applied, and whereas the original flow of water to the 20 wells was about 0.4 cubic metres in 24 hours, under the influence of the electrical current it rose to 2.5 cubic metres per hour. Before osmosis was applied the excavator could not be placed in or near the cutting, but after application it could be used anywhere. When the supply of current to certain wells was purposely cut off, soil near-by began to flow out of the slopes after a time, but re-application of current soon caused the flow to cease. In view of such tests, the results of further experiments should be of interest.

British Standards Institution. The 1947 edition of *Handbook No. 3* was published on 17 November 1947. The original edition of this *Handbook* was issued in 1944 and was followed in 1945 by a supplement; they were prepared as a supplement to the *Housing Manual* then recently published. The *Handbook* deals with building materials and components for housing, and in this 1947 edition there are summaries of some 240 British Standards, including a number of new ones, and where some have been revised since the earlier edition new summaries have been substituted. Such a volume cannot hope to be up to date at the moment of publication, as revisions of certain standards are often being made; the contents are correct as at 31 December 1946, but difficulties of publication have prevented it from being issued earlier; however, an inset leaflet brings the information up to date as on 30 June last, and in cases where a standard was under revision at the time the manuscript was being prepared the standard is marked 'under revision.' The Monthly Information Sheets help in giving the latest information, and these are issued free of charge to members. The summaries are arranged in numerical order in the body of the book, but there are three indices; the first is a classified list, arranged under main headings such as materials, structural components, pipes and fittings, and so on; then there is a numerical list in which the subject matter of the standard is outlined; and the last is a subject index arranged under the material or component itself; for example, aggregate, baths, slates, and it is hoped that these three indices will enable an inquirer to find, in one or other, the particular standard he wishes to consult. Copies of the handbook are available from the British Standards Institution, 24, Victoria Street, S.W.1, price £1 1*s.* post free.

Random Definitions

Fibre Building Boards. Any rigid sheet building material composed mainly or wholly of a mass of felted wood or other vegetable fibre, and may be either homogeneous or laminated with bituminous or other adhesives.

Insulating Boards. Fibre building boards of low density not more than 25 lb. per cubic foot, with a minimum thickness of $\frac{7}{16}$ in., and having thermal conductivity of not more than 0.4 B. Th.U/sq. ft./hr./1 in/°F. May be homogeneous, laminated, bitumen impregnated, or acoustic.

Wallboards. Fibre building boards, generally $\frac{3}{16}$ in. to $\frac{3}{8}$ in. thick. May be homogeneous, laminated, or bitumen laminated.

Hardboards. Homogeneous fibre building boards compressed to medium or high density. Medium; density of 30 lb. to 48 lb. per cubic foot. Standard; density not less than 50 lb. per cubic foot. Super; standard hardboards which have been further treated during the course of manufacture to increase their hardness or water resistance, or both.

Ready Mixed Concrete. Concrete delivered to the site in a plastic condition and needing no further treatment before being placed in position. At present there are three methods of producing it:—

Central mixed concrete; mixed at a central plant and delivered in containers with or without agitating devices.

Shrink-mixed concrete (*America*); materials incorporated and partially mixed at a central plant, the mixing being completed in a truck mixer.

Truck-mixed concrete (*transit-mixed concrete, America*); materials proportioned and placed dry in a truck mixer at a central plant, mixing taking place entirely in the truck mixer.

Practice Notes

Edited by Charles Woodward [*A*]

WAR DAMAGE. Architects Fees. Under the War Damage Act, 1943, 'proper cost' of executed work includes the cost of the necessary employment of an architect in an 'advisory or supervisory capacity in connection with the *execution* of the works'. The Commission distinguish between the services of an architect in connection with the *execution* of the works and those in *connection* with the works. This subtle distinction limits the fees repayable by the Commission to a claimant to the specific services laid down in their Scale of Fees, leaving those services rendered by an architect in *connection* with the works to be paid for by the claimant without repayment by the Commission. Such services include applications for building licences, permission under Building Acts, Town Planning, and Bye-laws, together with services in connection with party wall awards, all of which can be charged to a client in addition to the fees in connection with the *execution* of the works. He, however, cannot recover these additional fees from the Commission.

Clients should be given to understand that the payment of an architect's fees is initially a matter for them, repayment being claimed from the Commission when the claim for the executed work is made. As some considerable time may elapse before a claim can be made, it follows that unless a client is made aware of the position he will be under the impression that no payment of fees need be made until he has received the amount from the Commission. The position should be made clear at the time of the architect's employment and the client should be made aware of the additional fees payable by him and not recoverable from the Commission. There is an erroneous impression that the fees repayable by the Commission cover all the architect's services in connection with the making good of war damage. This, however, is not so, and where such an impression exists it should be corrected.

There is a Scale of Fees for the assessment and agreement of War Damage Claims (D.441/45) which was recommended by the Royal Institution of Chartered Surveyors and adopted by the R.I.B.A. The Scale applies to claims for Value Payments and Costs of Works payments, and the fees calculated on the Scale are payable by the Client and are not recoverable from the Commission.

The Scale, as far as it applies to Cost of Works claims, has been under consideration and the Council, on the recommendation of the Practice Committee, have decided to withdraw this part of the Scale, and to substitute payment on a *quantum meruit* basis for services in connection with a Cost of Works claim.

The Scale was published prior to the passing of the War Damage Act, 1941, when the procedure for notifying war damage was on Form V.O.W.1 which was sent to the District Valuer. This Form required a schedule of the damage together with an estimate of the cost of reinstatement, and the Scale was applicable to the services thus rendered. With the coming into existence of the War Damage Commission, however, the procedure was simplified, and the Scale so far as it applied to Cost of Works claims was not appropriate. The architect, therefore, will now charge fees for making the claim according to the time involved, but the client will be unable to recover such fees from the Commission.

The Scale so far as it applies to a claim for a Value Payment will remain, and the fees so calculated are payable by the client and are not repayable by the Commission.

In some cases licences cannot be obtained for the full amount required to make good war damage, and may even be granted for proportions of the required amount to be expended during stated periods. The architect has, however, earned more than half of his fees in respect of the required repair, and the fact that the War Damage Commission will only pay fees on the amount of the executed work which is claimed should not be a reason why the architect should not be paid by the claimant the full amount due.

MINISTRY OF TOWN AND COUNTRY PLANNING. The Ministry has published the first of a series of selected appeal decisions under interim development applications in the form of a Bulletin, which is obtainable at H.M. Stationery Office, price 6*d.* net.

In a Circular accompanying this Bulletin the Ministry explain that its object is to keep Authorities and others informed of important decisions involving new questions of policy, to illustrate the application of planning principles to particular cases and to provide decisions covering a wide variety of development to which reference can readily be made.

The Circular informs Authorities that it is often possible to avoid appeals by helpful and sympathetic handling of applications at an early stage, and this can be done by giving precise reasons for refusing an application and by avoiding such phrases as 'the development is contrary to sound planning principles', by assisting the applicant in his endeavour to find an alternative site and by officers of the local authority taking care to avoid giving, in the course of conversation with the applicant, any grounds for believing that the proposed development will be permitted, when in fact it is inconsistent with the planning proposals for the area.

The Bulletin will be published periodically.

Notes for the Guidance of Buyers and Sellers of Land. The Ministry has issued notes for guidance during the period between the passing of the Town and Country Planning Act, 1947 and the 'appointed day', which is expected to be April 1 1948. The notes refer to the payment of the Development Charge.

It is pointed out that a Development Charge may be payable in respect of any building or other development which is *begun* after the 'appointed day', even though permission to develop may have been given by the local planning authority before the 'appointed day'. The Charge is broadly the difference between the value of the land if restricted to its existing use and its value with the planning permission to build or to change the existing use to another use.

The owner of land on the 'appointed day' will be entitled to submit a claim in respect of depreciation of land value. A sum of £300,000,000 is provided in the Act for this purpose. In considering such claims there may be a distinction between transactions which took place before the Bill was published (7 January 1947), and those taking place after full public notice had been given of the terms of the Bill.

Development Charges are, by the Act, transferred to the State. After the 'appointed day' a person selling land ought not to expect to receive more than its existing use value, and a purchaser cannot be expected to pay to the vendor more than that value, because when the purchaser comes to develop in accordance with a permission of the local planning authority, he will have to pay the Development Charge to the Central Land Board set up under the Act. A purchaser cannot be expected to pay the Charge twice over, i.e., once to the vendor and once to the Central Land Board. In cases where the vendor demands an unreasonable price, the Act gives powers for compulsory purchase at the existing use value.

If before the 'appointed day' land is compulsorily purchased by a Government Department or a local or other public authority the price payable is limited to the existing use value as on 7 January 1947, however ripe for development the land may be. The owner of the land will on the 'appointed day', have a right to claim on the £300,000,000 as if he was still the owner.

The Act does not in terms control the selling price of land in the case of private sales, and purchasers of land for development purposes must make their own arrangements with the vendor when entering into a contract to purchase.

There are two main alternatives open to vendor and purchaser :—

(*a*) That the purchaser pays to the vendor the existing use value of the land and agrees to claim on the £300,000,000 and pay to the vendor any payment received.

(*b*) That the purchaser pays the vendor a price which includes development value. A purchaser adopting this course would probably do so in the expectation of receiving a payment out of the £300,000,000.

Contracts for sale of land may provide for the conveyance to be before or after the 'appointed day', and should therefore include provisions to suit either condition. No doubt vendors and purchasers will seek professional advice before entering into such contracts.

Book Reviews

The Architectural Association 1847-1947, by *John Summerson*. 8½ in. viii+ 55 pp.+ pls. Pleiades, for the Assn. 1947. 12*s.* 6*d.*

We are fortunate in having Mr. Summerson's experienced hand to write the Centenary Book of the A.A. He brings to the task a fine discernment for whatever is valuable or interesting, and makes the story read with a cheerful pace, never losing the thread of history that holds it together.

He divides the hundred years into five periods by premises occupied by the A.A. in their strange eventful history. As Mr. Churchill said of the planning of the House of Commons: 'We shape our buildings and in the end they shape our lives'.

The first chapter—Lyon's Inn—is of the first twelve years, and is the most interesting to us at this distance of time. For consider what the object of the Association was—an endeavour on the part of the students themselves to create an improved system of architectural study. The only door to the profession was by articled pupilage, and was too often a waste of precious time, for there were offices in which nothing was learnt because nothing was built. Students spent years in copying the orders in elaborate drawings for which privilege they paid Mr. Pecksniff £500. Authority frowned upon any suggestion for supplementing this thin architectural diet, but Robert Kerr and his friends were now in arms. The starved spirit of youth demanded better things, and failing to stir the conscience of their masters decided to take matters into their own hands and teach themselves.

The first step was to associate and form a School of Design, with the concomitants of meetings for discussion and soirées to hold things together. Thus out of the pupilage system was born the school training of today. Not only that, but the A.A. was the first voice to raise the question of examinations to test that training and afford a means of obtaining membership of the R.I.B.A., previously open only to practising architects. In Mr. Summerson's words: 'The achievement of the A.A., during its first twelve years was very remarkable. Here was a group of beginners who, by their own efforts and with the trifling assistance of only a handful of their elders, undermined an old and firmly-established system of training and laid the foundations of the completely different system which we enjoy today. It is doubtful if such a performance can be paralleled in any other profession.'

The Conduit Street period, though less spectacular, was one of steady growth. The influence of Leonard Stokes began to be felt towards the end of this chapter, and to him more than any other man of the period we owe the present system of education. His strong personality and constructive mind, no less than his outstanding ability as an architect, were to affect the fortunes of the A.A. for the next thirty years.

The Evening School was founded and became so popular that other premises were needed, and the move to Great Marlborough Street was made, and a period of steady progress and increasing membership began.

The foundation of the Day School was surprisingly successful, and again the need for space became urgent. Ambitious as ever, the A.A. began to raise subscriptions for building their own school, when the redoubtable figure of Maurice B. Adams rose on the horizon with an offer of the Royal Architectural Museum in Tufton Street as a free gift, with a few simple conditions attached. The offer could not well be refused under all the circumstances, and to Tufton Street we went, after extensive additions had been made by Stokes. In spite of its bright promise and the expenditure of a large sum on improvements, it was not the right atmosphere for youth. Inaccessible, and full of depressing casts of the Ruskin period, the dead hand of 1869 exerted a curiously enervating pressure, and the ten years spent under these conditions were endured with increasing uneasiness till the war of 1914 put an end to them, and the premises were sold, while the A.A. carried on through the war in temporary quarters.

Bedford Square was acquired at exactly the right moment, and was available for students returning from service in 1919. A period of tremendous activity was begun in the exuberant confidence of those post-war years, and which far surpassed anything that had gone before.

The premises were ideal for the work of the A.A., and were admirably extended by Robert Atkinson. To him, with Yerbury and Robertson, chiefly belongs the credit of the successful passage from war to peace, and the twenty years of spectacular success that has followed. We are most fortunate in having Howard Robertson as President in the Centenary Year.

Mr. Summerson has told us a splendid story of persistency and achievement, and one that cannot be too widely read in 'these hollow years, brimming with hope'. What better memorial could there be to our Founder and first President, Robert Kerr?

AUSTEN HALL [*F*

An Outline Development Plan for the County of the City of Worcester, by *Anthony Minoprio* and *Hugh Spencely*. 11 in.×8½ in. pp. 72. Worcester City Council. 1946.

The City of Worcester is undertaking its replanning in exemplary fashion. First of all, experts from Birmingham University were called in to diagnose, and they issued their report in the admirable book entitled 'County Town'. On their findings, Messrs. Minoprio and Spencely were asked to reshape the City, and they in their turn have presented the outline of their scheme in the book under review, the publication of which coincided with the holding of a Civic Exhibition in Worcester. At this exhibition the citizens were given the opportunity to examine the plans in detail, and Brains Trusts were held to allow of the airing of views and the seeking of further information. By their handling of the initial task the City Corporation have richly deserved success in the ultimate work of replanning their City.

That the operation will require the most delicate touch will be evident to all who know Worcester. To replan a blitzed city, or a place without character, is easier than to replan a city like Worcester, untouched by war, and having a subtle flavour of its own. Worcester is a cathedral city, with a few old-established and world-famous light industries; but it is primarily the workaday county town of a thriving agricultural community. It would not seem that, flanked on either hand by Malvern and Stratford, and with the Cotswolds to the south, there is any call to doll Worcester up as a holiday resort, and the planners will be judged by their success in retaining the present atmosphere of the city.

The Outline Plan is of necessity built upon a new road system to relieve the congestion of traffic. The problem has been attacked with boldness and imagination, and the new approach from the south, the tree-lined way along the canal, and the straight run to Shrub Hill Station should be welcomed by the most conservative. But it seems doubtful whether the volume of east-west traffic can justify the disturbance to the heart of the city which the proposed two-pronged road from the bridge would create. The long north-south artery, with its medley of midland architecture, culminating in the cathedral at the southern end, is redolent of Worcester's atmosphere, and the crossing of this main street by two new wide thoroughfares, and the opening up of a square off the street opposite the Guildhall, must surely destroy some of the character of the place. Inherent in the scheme is the abolition of that cosy, country-town little square known as Angel Place, and, to one who has known Worcester all his life, sorrow at the loss of Angel Place cannot be assuaged by the promised planting of *liquidambar styraciflua* and *magnolia salicifolia*; nor can the traffic easement achieved by the widening of the bottleneck at the south end of High Street compensate for the loss of drama in the approach to the cathedral and the reduction in scale of the towering mass.

Apart from the High Street, the core of the planning from the æsthetic viewpoint is centred round the riverside and the cathedral. It is proposed to abolish the medley of buildings along the east bank of the river, and to turn the site between the cathedral and Pitchcroft into gardens, with public buildings placed here and there. A vision of the traditional English municipal park, replete with bandstands and paddling pools, may cloud the judgement, but one wonders whether a built-up quayside—of which there is a delightful example up the river at Bewdley—would not be more in keeping with the character of the city, and more likely to maintain the scale of the cathedral. Again, the creation of a civic centre on a byway, detached from the magnificent eighteenth-century Guildhall,

seems inappropriate, and the proposed formation, opposite the Guildhall, of a square off the High Street would seem to suggest another solution. The clearing of the east end of the cathedral with an enlarged precinct is a most desirable reform, but the proposed monumental steps from the riverside to the west door seem out of keeping with a Gothic building. And, if one may have one last grouse, why remove the hedges from the cathedral meadows? The Dean and Chapter will have to make a corner in barbed wire.

For those who know and love Worcester it is easy enough to criticize when sweeping changes are proposed. It is almost as if the operation were to be performed on oneself. For fifty years we have spelt over the glaring advertisement of Worcester Sauce on the riverside façade, and the white lettering of Dent's Gloves down the factory chimney under the very nose of the cathedral; and Worcester will never be the same to us when they are gone. Nor will market-day be the same when the traffic jams have vanished, when the stream-lined cars hum along the byways, and when fountains play and cherries bloom in the heart of the ancient city.

Such may be the reflections of the average citizen. But this excellently produced book is intended to provoke comment and to stimulate criticism, and we may rest assured that the authors, while looking to the future of Worcester, will pay just tribute to her historic past.

HUMPHREY PAKINGTON [*F*]

Structural Engineering, by *Joseph Husband* and *William Harby*. 5th ed. 4to. pp. xiv+591. Longmans Green and Co. 1947. 21*s*. This is the fifth edition of this standard work, presenting in one volume the principles of the design of steel, masonry, and plain and reinforced concrete structures. Five extra chapters, an appendix and many fresh diagrams and illustrations have been added.

Correspondence

THE PROFITS OF AN ARCHITECT'S PRACTICE

Sir,—For the benefit of those who are interested in such statistics, I find that my own modest little practice, conducted in one office room, without any staff, and yielding normally a gross taking of fees between £1,000 and £1,500 p.a., has the following result:

For 1946. Expenses equalled 27 per cent of fees.

For 1947. Expenses equalled 28 per cent of fees.

bearing the balance as profit.

These results are taken from professionally audited balance sheets. I enclose my card, and ask to be allowed to subscribe myself ANON.

Editor's Note: *The* JOURNAL *does not normally publish anonymous letters, but for obvious reasons the writer of the above letter would not wish his name to be published. In view of the interest aroused by the recently concluded series of lectures on Office Organization we thought this letter would be of interest to members.*

RURAL HOUSING

Sir,—I read with interest your description of the Rural Housing for Loddon R.D.C. by Messrs. Tayler and Green [*A*/*A*]. Having ourselves encountered the difficulties of providing terrace houses with through access for manure, etc. we cannot understand why in this particular design this difficulty is claimed to be solved. Our own solution was eventually to give up the terrace in favour of the semi-detached house. This also, of course, helps with the dustbin problem.

We find also that the housing of a motor-cycle and sidecar is often an important consideration in Rural Housing and that the simplest method is to have, for every house, a store or utility room with double doors, giving an opening 5 ft. wide. If this is not done there is a great danger of a series of sheds appearing which will spoil the appearance of even the neatest of terraces. The provision of garages away from the houses is in practice an inadequate solution as the tenants want such things immediately on hand.—Yours faithfully,

WILLIAM CRABTREE [*F*]

A copy of Mr. Crabtree's letter was sent to Messrs. Tayler and Green, who reply:

Through access. The JOURNAL clearly stated 'when it is decided, as in this case, to build rural housing in the form of terraces . . .', may we now finish this sentence by adding, 'It is no solution to any *terrace* problems which arise to build pairs!'

Dustbins. A pail and lid is kept in the kitchen and emptied daily into either garden pits (a bad practice inevitable where there is no refuse collection) or into a dustbin inside or outside the store door.

Garages. When motor-cycles *and* sidecars are shoved into that poor ill-defined, overloaded apartment, the utility room, we feel the time has arrived to provide a garage. Double doors into the store would destroy valuable restricted wall space. All our plans are designed to take a garage plus store (although one only was illustrated). This is obviously the eventual standard necessity, but the Ministry of Health can well be pardoned at the moment for preferring to provide human shelters first.

Shacks. This subject is worth a long article plus a severe campaign against it. Briefly, it seems to depend on the local authority's strict enforcement of the bye-laws. To provide *sufficient* storage area decently walled and roofed would, judging from many housing estates, mean roofing in the whole garden. Shackery has become a national habit, and it is wrong to think that it will automatically stop when more stores and garages are provided.—Yours faithfully, TAYLER AND GREEN [*A*/*A*]

Obituaries

John Gordon Dower [*A*], whose death occurred on 3 October, was in his forty-eighth year. Professor W. Holford has sent the following appreciation:—

'John Dower possessed a fine and unusual combination of qualities that made him equally effective in and out of office; he had the trained mind of the administrator, the skill of an architect with a good eye for country, and an enthusiasm for preserving and cultivating the natural scenic resources of Britain that amounted to a genuine sense of mission. Thus he was essentially a 'town and country planner', not only because he had an instinct for order and fitness but because he believed thoroughly in the principles of his profession, and knew how to apply them in practice.

'In 1941, after a period in the army, he joined the small nucleus in the Ministry of Works and Buildings which was constituted by Lord Reith to do some preliminary thinking about the problems of reconstruction after the war. To Dower this was simply a case of picking up officially the reins he had laid aside in order to go and train recruits. He recognized at once the authority that national planning and the effects of war damage would give to the good causes for which he had been fighting, even before 1939. He flung himself into the daily work of committees; and used his talent for drafting to give clearer shape to his ideas as well as to those of other people.

'Walking had always been his recreation; and walking for him went with a study of geology and forestry, of landscape and rock formation, of access to mountains, ordnance maps, footpaths and farms. So it was not long before he began, in the midst of his general labours on draft legislation, to gather together the threads of a pattern that had long since begun to form in his mind—the pattern of a series of related national parks, nature reserves and regional open spaces, covering England and Wales. He developed in two directions simultaneously the proposals of the former Standing Joint Committee on National Parks; first by studying the terrain itself, the distribution of the major open spaces, their configuration and boundaries, and the claims on them of urban populations in search of recreation, adventure or peace of mind; secondly by relating the proposals to the emerging powers and responsibilities of what became in 1943 the Ministry of Town and Country Planning.

'In neither of these fields of activity did he spare himself. In fact it may be said that the national parks come to Britain they will all have been walked out and thought out by John Dower. Gradually, and in spite of periods of enforced rest, which he must have known were insufficient to bring him back to health, he concentrated more and more on his great objective. He wrote continuously and with increasing decision, as if he felt that the project could only be hammered out at white heat. Yet, curiously enough, he continued to penetrate at the same time a maze of detail which was all put in order and added to the argument. He was an administrative and a technical committee in one. When in 1944, he brought a draft of his report for discussion at the Ministry, it compelled the admiration of every officer that sat round the table and heard him outline his principal proposals. There were some doubts and disagreements even then; but it was clear that the case for national parks had been put with such knowledge and conviction that it must be followed up by the procedure of official recognition and public presentation.

'John Dower's *Report to the Minister of Town and Country Planning* was published in May 1945 as a one-man White Paper. The appointment of the National Parks Committee under the chairmanship of Sir Arthur Hobhouse followed soon after; and it was Dower who blazed the trail for them to follow. His visits to London grew less frequent, but his correspondence positively increased. He argued as forcibly as ever for the inclusion of the Roman Wall in the first list of selected areas; he wrote notes and itineraries and instructions from his house at Cambo, in Northumberland. And at Christmas 1946 he found time to send his friends a small collection of his verses which told them unmistakably that he knew his work was nearly done.

'He lived to see published the full reports of the National Parks Committee, including those on nature reserves and on access to the countryside. When these provisions reach the Statute Book, and for long after that, we shall all have cause to be grateful to John Dower. His friends and colleagues remember him with affection, and salute his courage with respect.'

Thomas Geoffrey Lucas [*F*], who died on 3 October 1947, aged 75, had been out of practice for some time owing to ill-health. Dr. H. V. Lanchester [*F*] has sent the following appreciation:

'Geoffrey Lucas was a student at the R.A., and became an Associate of the R.I.B.A. in 1899; from then to 1914 he carried out a good deal of work, mainly ecclesiastical and domestic, in a manner marked by good taste and well-studied detail. Examples of this were to be seen at Hampstead Garden Suburb, in houses at Ponders End and Broxbourne, as well as elsewhere in the neighbourhood of his home town of Hitchin, which has a bank designed by him. T. A. Lodge and Paul Badcock were pupils in his office. In 1912 he was awarded the Godwin Bursary, and in 1911 won the competition for a £500 house, built at Gidea Park, Essex.

'After the war, in 1919, he joined H. V. Lanchester, and took charge of his work in housing and other branches during his partner's absences in India. Later on, T. A. Lodge also joined this firm, and the three partners shared in the design and supervision of numerous works, including Leeds University, St. Bartholomew's Hospital, premises for Messrs. Bovril, Beckenham Town Hall, various housing schemes and buildings in India and elsewhere.

'Subsequently it appeared that the extent of these activities did not offer T. G. Lucas the scope he desired for giving an intensive study to specific undertakings which he felt gave the best exposition of his talents, and he retired from the partnership.

'He was keenly interested in the traditions of English church building, and in ecclesiastical planning and equipment; during his career as an architect a numerous and varied range of buildings showing a high standard of architectural quality give him a recognized place among his contemporaries.'

Frank Loughborough Pearson [*F*], who died suddenly on 8 October 1947, in his 84th year, was the only son of the late John Loughborough Pearson, R.A., perhaps the most eminent of the English Gothic revival architects, and a nephew of Ewan Christian, formerly architect to the Ecclesiastical Commissioners. Mr. Herbert Passmore [*F*] has sent us the following appreciation:

'With his background, it is not surprising that, on leaving Winchester College, he decided to adopt architecture as his profession and entered his father's office. Eventually, after a period of training, he became closely associated with his father in his extensive practice.

'Apart from the work for which his father was mainly responsible Frank Pearson developed a considerable practice of his own, and among the more important buildings attributable to him are the completion of the western towers of Truro Cathedral (after his father's death), the first portion of the Cloisters and the Cathedral School; the Cathedrals at Brisbane, Queensland, and Auckland, New Zealand; alterations and additions to the Cathedrals at Wakefield and Perth; the rehabilitation of Hever Castle for the late Lord Astor, with its adjacent 'Village' for the accommodation of guests, and other ancillary buildings, and Messrs. Novello's premises in Wardour Street.

'Pearson's training naturally inclined him to favour traditional English Gothic work, but his designs for the English Church in Madrid, the Novello building and many other examples, domestic, scholastic and commercial, shew that he could work sympathetically in other styles. He was particularly successful in his country house work, notably in the neighbourhood of Whitchurch, Oxfordshire, where he made his home for many years.

'He was a sound critic, downright, but kindly in his judgement, and could always be relied upon to give good advice when his advice was sought.

'He was an enthusiastic volunteer and served for several years, towards the end of the last century, in the Artists Rifles; he was also a keen yachtsman and golfer.

'Frank Pearson married in 1891 Cecilia, the eldest daughter of the late Alfred Littleton, Chairman of Novello and Co. Ltd., and had four daughters, three of whom survive him.'

Notes and Notices

NOTICES

The Second General Meeting, Tuesday 25 November 1947

The Second General Meeting of the Session 1947-48 will be held on Tuesday 25 November 1947 at 6 p.m. for the following purposes:—

To read the Minutes of the Inaugural General Meeting held on Tuesday 11 November; formally to admit members attending for the first time since their election. Dr. Nikolaus Pevsner to read a paper on 'The Picturesque in Architecture'.

The Third General Meeting, Tuesday 9 December 1947

The Third General Meeting of the Session 1947-48 will be held on Tuesday 9 December 1947 at 6 p.m. for the following purposes :—

To read the Minutes of the Second General Meeting held on Tuesday 25 November; formally to admit members attending for the first time since their election. Mr. John Gloag [*Hon. A*] to read a paper on 'The Architect's Responsibility for Industrial Design'.

Subscriptions of Members resident overseas in Areas where no Allied Society is available

The Council have approved a recommendation of the Finance and House Committee that subscriptions payable by members resident overseas in areas where no Allied Society is available shall be reduced to conform to the amounts paid by members who are also members of overseas Allied Societies in the areas where they exist.

With effect from 1 January 1948, the subscriptions payable by members resident overseas in areas where no Allied Society is available will be as follows:—

Fellow, £4 4*s*.

Associate or Licentiate: £3 3*s*.

Letters have been sent individually to all members affected by this reduction, but in any case of doubt a member should write to the Secretary for information before altering his cheque or amending his Banker's Order.

Annual Subscriptions

Members' subscriptions and students' contributions will become due on 1 January 1948, and those members and students who pay by bank order are reminded that the orders should be amended to provide for payment of the correct amounts which are :

Fellows, £7 7*s*.
Associates, £4 4*s*.
Licentiates, £4 4*s*.
Students, £1 11*s*. 6*d*.

The R.I.B.A. London Architecture Bronze Medal 1947

The attention of members is drawn to the form of nomination and the conditions, subject to which the award will be made, for a building built within a radius of eight miles from Charing Cross during the three years ending 31 December 1947, enclosed with this issue of the JOURNAL Any member is at liberty to nominate any building for consideration by the Jury.

Nomination forms must be returned to the Secretary R.I.B.A. not later than 28 February 1948.

R.I.B.A. Examination for the Office of Building Surveyor under Local Authorities

At the R.I.B.A. Examination for the Office of Building Surveyor Under Local Authorities held on 8, 9 and 10 October 1947, ten candidates presented themselves and the following were successful :—

Mr. Charles K. Briggs, Nottingham, Mr. William H. Hale, Hartford, Hunts, Mr. Harold Latham, Wigan, Mr. William E. Marshall, Burnley, Mr. E. Frank Payne, Blackwood, Mon. and Mr. Charles Reid, Stranraer.

The Use of Titles by Members of the Royal Institute

In view of the passing of the Architects Registration Act 1938, members whose names are on the Statutory Register are advised to make use simply of the title 'Chartered Architect' after the R.I.B.A. affix. The description 'Registered Architect' is no longer necessary.

Associates and the Fellowship

Associates who are eligible and desirous of transferring to the Fellowship are reminded that if they wish to take advantage of the next available election they should send the necessary nomination forms to the Secretary, R.I.B.A., as soon as possible.

Christmas Holiday Lectures to Boys and Girls

The next series of talks on architecture to boys and girls will be given by Mr. Richard Sheppard [*F*] on 5, 7 and 9 January 1948. Further details are published on page 1 of this JOURNAL.

Journal Subscription

Owing to restrictions on the supply of paper it will be possible to publish only 12 numbers of the JOURNAL for volume 55, the volume commencing November 1947. The present subscription rates will, therefore, be reduced from

£2 to £1 10*s.* for non-members, and from £1 5*s.* to £1 for probationers and members of Allied Societies who are not members of the R.I.B.A.

Subscribers who paid at the higher rate for volume 54, ending October 1947, for which only 13 numbers were published, will be credited with a proportionate refund when renewing their subscription for volume 55.

Disciplinary Action

Mr. G. Forsyth Lawson, of 25a High Street, Banbury, a Licentiate, was reprimanded by decree of the Council dated 14 October 1947, made pursuant to the Bye-laws.

Cessation of Membership

Under the provisions of Bye-law 21 the following have ceased to be members of the R.I.B.A.:

As Associates. Frederick Roy Easton, R. Fielding Farrar, Roderick Charles Fisher, John William Kidd, Colin John MacMahon, Daniel J. MacRandal, James Napier, Philip Evans Palmer, and John Steel.

As Licentiates. Cyril Eyres Ainley, Ernest Bower, John Francis Cavanagh, Reginald Kenworthy, and Nehemiah Rigley.

ALLIED SOCIETIES

Nottingham, Derby and Lincoln Architectural Society: Annual dinner was held at the Black Boy Hotel, Nottingham, on 31 October. The Society was honoured by the presence of the Lord Mayor of Nottingham, together with the Sheriff, and the Mayors of Derby and Lincoln, also Sir Lancelot H. Keay, the President of the R.I.B.A., the Secretary of the R.I.B.A., and many other distinguished guests. Mr. W. G. Jacobson proposed the health of the Royal Institute of British Architects and Allied Societies and the President, Sir Lancelot H. Keay, suitably replied, and said that never had co-operation, tradition and dignity been more necessary than today. He also said that it gave him great pleasure to hand the Diploma and Bronze Medal to Mr. William H. Hamlyn, F.R.I.B.A., Architect of the L.M.S. Railway Co., for the School of Transport, Derby. He also handed to Brigadier L. Manton, D.S.O., O.B.E., a replica of the Bronze Medal, on behalf of the building owners.

Birmingham and Five Counties Architectural Association: Fourth General Meeting will be held on 28 November at the Birmingham Photographic Society, York House, Great Charles Street, at 6.15 p.m., when Mr. W. A. Clark (President) will give a talk, illustrated by slides, on 'Memories of Old London.'

Bristol Society of Architects. An interesting programme has been arranged for the General Meetings on the second Tuesday of each month during the winter session. On 9 December a paper entitled 'The Graphic Arts in England' will be read by Mr. J. E. Barton, M.A. [*Hon. A*] and on 13 January Mr. H. J. Venning [*A*] will talk on 'Arbitrations'. Among recent activities was an excursion to the Mediæval Manor House at Great Chalfield.

Changes in Officers and Addresses

Manchester Society of Architects. President: Mr. P. G. Fairhurst, M.A. [*F*], 55 Brown Street, Manchester, 2.

Institute of South African Architects. President-in-Chief: Mr. N. L. Hanson, B.Arch. [*A*], 2nd Floor, 20th Century Building, President Street, Johannesburg, South Africa.

Natal Provincial Institute of Architects. Secretary and Treasurer: Mr. A. H. Ritchie, 8 Poyntons Chambers, Smith Street, Durban, South Africa.

Nottingham, Derby and Lincoln Architectural Society. President: Mr. R. E. M. Coombes [*F*], Heslam Chambers, 191 High Street, Lincoln.

Northern Architectural Association, Tees-side Branch. Acting Secretary: Mr. R. M. Archibald [*A*], 23-25, Albert Road, Middlesbrough (4154).

Transvaal Provincial Institute of Architects. President, Mr. C. E. Todd, O.B.E., M.C. [*A*], 45, Prudential House, Prudential Arcade, Pretoria, South Africa. Secretary, Miss C. R. Paiker, 611 Kelvin House, 75 Marshall Street, Johannesburg, South Africa.

South-Eastern Society of Architects, Brighton District Chapter: Hon. Secretary, Mr. John B. Denman [*A*], 27 Queen's Road, Brighton, 1, Sussex.

New Zealand Institute of Architects. President: Mr. R. H. Fraser, P.O. Box 872, Dunedin, New Zealand.

The Royal Australian Institute of Architects. Secretary: Mr. J. D. Storrie, Barrack House, 16 Barrack Street, Sydney, N.S.W. *Queensland Chapter.* President: Mr. T. B. F. Gargett, Commerce House, Adelaide Street, Brisbane, Queensland. Hon. Secretary: Mr. R. W. Voller, c/o Architects' Group, Permanent Bank Buildings, 113 Queen Street, Brisbane. *New South Wales Chapter.* Hon. Secretary: Mr. A. A. Gamble, 8 'Greentrees', 11a Silex Road, Clifton Gardens, Sydney, N.S.W.

Buckinghamshire Society of Architects. Acting Chairman: Mr. G. M. McCorquodale [*L*], 92 High Street, Marlow, Bucks, in place of Mr. L. J. Parkinson [*A*], who has taken up an appointment in Scotland.

Correction. In the September issue of the JOURNAL the name of Mr. S. E. Bragg [*A*] was incorrectly given as the Hon. Secretary of the Essex, Cambridge and Hertfordshire Society of Architects. Mr. Bragg is the new Hon. Secretary of the **Chelmsford District Chapter.**

Mr. C. S. Jaques [*A*] has been appointed **Hon. Registrar** of the Essex Society.

COMPETITIONS

New Memorial Building at Great Russell Street, W.C.1, for the T.U.C.

The General Council of the Trades Union Congress invite architects of British nationality, or architects resident in this country, to submit designs in competition for the T.U.C. Memorial Building, which they propose to erect on a site in Great Russell Street, London.

Assessor: Sir Percy Thomas, O.B.E., Ho LL.D., P.P.R.I.B.A.

Premiums: £2,000, £1,000 and £500.

Last day for submitting designs: 31 May, 194

Last day for questions: 1 December, 194

Conditions may be obtained on applicatio to the General Secretary, Trades Union Co gress, Smith Square, London, S.W.1.

Deposit: £2 2s. 0d.

Proposed Memorial at Liverpool to the M ssi Naval Auxiliary Personnel of the Second Wor War

The Imperial War Graves Commission invi Architects who are ex-serving members His Majesty's Forces to submit designs competition for the Memorial to the Missi Naval Auxiliary Personnel of the Second Wor War, which they propose to erect on a site the promenade at Liverpool.

Assessor: Mr. Edward Maufe, A.R.A. [*F*].

Premiums: £100, £60 and £30.

Last day for submitting designs: 16 Jan uary 1948.

Conditions may be obtained on applicatio to the Secretary, Imperial War Graves Com mission, 32 Grosvenor Gardens, S.W.1.

Deposit: £1.

COMPETITION RESULT

Bombay European Hospital Trust: Limited Competition for designs

1. Messrs. Saxon Snell and Phillips [*F*/*F*]

BOARD OF ARCHITECTURAL EDUCATION

R.I.B.A. Prizes and Studentships—Mounting of Drawings

The attention of intending competitors i drawn to item No. 3 of the General Conditions In view of the difficulty of obtaining materia for mounting drawings it has been decided t waive this regulation for the Prizes and Student ships offered for award this year.

GENERAL NOTES

Decorations and Distinctions

Barlow: L. R. [*A*] Major R.E.

Awarded Chevalier of the Order of Leopold II with Palm: Croix de Guerre 1940 with Palm.

Wright: A. F. S., M.B.E. [*S*] Major R.E.

Again Mentioned in Despatches.

The Next A.S.B. Lecture at the R.I.B.A.

Tuesday 2 December at 6 p.m., '*Choice of Structural Type and its Cladding*', by Mr. R Llewelyn Davies [*A*].

SYNOPSIS

(1) Scope of the subject.
(2) Research stage.
(3) Development stage.
(4) Production stage.

Light refreshment will be provided from 5.5 p.m. to 5.55 p.m.

Notes from the Minutes of the Council

MEETING HELD 14 OCTOBER 1947

The Honorary Fellowship: Her Royal Highness the Princess Elizabeth has been graciously pleased to accept the Council's nomination for election to the Honorary Fellowship.

The President of the Board of the Association of Architects of the Netherlands: Mr. A. J. van der Steur, President of the Board of the Association of Architects of the Netherlands, addressed the Council. The Council requested Mr. van der Steur to convey to his Association their expression of cordial good wishes and friendship on behalf of the Institute.

Appointments:

B.I.N.C.; R.I.B.A. Representation: The following members have been appointed to complete the representation of the R.I.B.A. on the Building Industries National Council:

Mr. A. F. B. Anderson [*F*].
Mr. H. T. Cadbury-Brown [*A*].
Mr. A. E. Geens [*F*].

Council of the British School at Rome: R.I.B.A. Representative: The Council have reappointed Mr. A. B. Knapp-Fisher, F.S.A. [*F*], as a R.I.B.A. representative on the Council

of the British School at Rome for a further period of three years.

The Lord Mayor's Air Raid Distress Fund: Memorial Homes for Aged People: At the request of the Chairman of the Aged People's Homes Committee the following members have been appointed as a panel to advise on plans submitted for the erection of groups of houses in a number of cities and towns:
Mr. C. H. James, R.A. (Vice-President).
Mr. Edward Armstrong [*F*].
Mr. I. B. M. Hamilton [*F*].

Thomason College, Roorkee, Centenary Celebrations: R.I.B.A. Representative, Mr. Walter S. George [*F*].

Women's Advisory Council on Solid Fuel: R.I.B.A. Representative, Miss G. W. M. Leverkus [*F*].

R.I.B.A. Architecture Bronze Medal, South Wales Institute of Architects: R.I.B.A. Representative on Jury, Mr. S. E. Urwin [*F*].

R.I.B.A. Representatives on Codes of Practice Committees: 1.5 Committee—Internal Walls and Partitions, Mr. J. H. Greenwood [*A*]; Public Works, Building and Constructional Work, Mr. Stanley Hamp [*F*] reappointed for a further period; Electrical Equipment of Buildings, Mr. C. H. Perkins [*A*] reappointed for a further period.

R.I.B.A. Representatives on B.S.I. Committees: NF/19 Wrought Aluminium and Light Alloys, Mr. Charles Sykes [*A*] in place of Mr. Richard Nickson [*F*]; ASB/—Asbestos Cement Products, ASB/1—Asbestos for Cement Sheeting, ASB 2—Asbestos Cement Pressure Pipes, ASB 3—Light and Heavy Flue Pipes, ASB/4—Rainwater and Soil Pipes, Mr. Cyril Adler [*A*] in place of Mr. Richard Nickson [*F*].

Membership of Council: Lieut.-Colonel F. J. Taylor [*F*], Representative of the Devon and Cornwall Architectural Society, has resigned from the Council, and Mr. H. V. de Courcy Hague [*F*], President of the Society, has been appointed in his place.

Mr. C. H. Aslin [*F*] has been reappointed Chairman of the Official Architects' Committee and a member of Council ex-officio.

Mr. P. K. Hanton [*F*] has been reappointed as representative of the Salaried Members' Committee on the Council.

Revision of the R.I.B.A. Scale of Professional Charges: In accordance with Bye-law 38, the Council, having considered observations submitted by members, confirmed their decision made on 24 June 1947 that the Scale of Charges should be amended as follows:
(i) £200 and £4,000 be substituted respectively for £100 and £2,000 as the contract sums applicable to the basic percentage scale under Clause 2 (*a*) (ii).
(ii) Until further notice, on all final accounts for fees chargeable under Clauses 2 and 7 up to and not exceeding a total of £1,150 there shall be a surcharge of 15 per cent on the first £1,000 of the fee.

The Council decided that the effective date for these amendments to come into force shall be 1 December 1947, and that the amendments shall not be applied retrospectively to any work for which instructions had been given to the architect prior to this date.

Fees for the Assessment and Agreement of War Damage Claims—Claims for Cost of Works Payments: The Council approved a recommendation of the Practice Committee that Clause (ii) of the Scale of Fees for the Assessment and Agreement of War Damage Claims approved in March 1945, be withdrawn and that members be advised in future to calculate fees for services in connection with claims for Cost of Works Payments on a *quantum meruit* basis.

Scale of Architects' Fees for State-Aided Multi-storey Flats: The Council approved the terms of the 'Interpretation' of Sections A2 and A3 of the Scale of Fees for State-Aided Multi-storey Flats. The terms of the 'Interpretation' have been agreed by the Ministry of Health and are incorporated in the reprint of the Scale issued in July 1947. This reprint has been published in the October JOURNAL.

R.I.B.A. London Architecture Bronze Medal: The Council took note of the award for the period of ten years ending 31 December 1946 made by the Jury entrusted with the duty of the R.I.B.A. London Architecture Bronze Medal in favour of the Blackheath Road Police Section House, designed by Messrs. Horace Farquharson and Donald H. McMorran [*F F*].

R.I.B.A. Bronze Medal: Nottingham, Derby and Lincoln Architectural Society: The Council have approved the recommendation of the Jury that the R.I.B.A. Bronze Medal in the area of the Nottingham, Derby and Lincoln Architectural Society for the period of ten years ending 31 December 1946 be awarded in favour of the L.M.S. School of Transport, Derby, designed by Mr. William H. Hamlyn [*F*].

Christmas Holiday Lectures for Children: Mr. Richard Sheppard [*F*] has accepted the Council's invitation to give the Christmas Holiday Lectures to Children at the R.I.B.A.

Gift of Books to Library: The Council have received with deep appreciation a generous gift from Mr. Grahame Tubbs [*A*] of eighty-three works, all of which go to fill gaps in the library collection.

Gift Parcels: The Royal Victorian Institute of Architects: The Council record with deep appreciation and gratitude the generous action of the Royal Victorian Institute in sending to some 300 architects or their dependants in the United Kingdom Christmas gift parcels of food. The names of recipients have been selected in conjunction with the Architects Benevolent Society and the Presidents of the Allied Societies.

Pan-American Congress of Architects 1947—Lima: A letter of greetings and good wishes from the Royal Institute has been sent to the Pan-American Congress of Architects at their meeting in Lima in October 1947.

Subscriptions of Members Overseas in Areas where no Allied Society is available: The Council have approved the reduction of subscriptions of members resident overseas in areas where no Allied Society is available to the following amounts to conform to the subscriptions payable to the Royal Institute in areas where an Allied Society is available:
Fellow, £4 4*s*.
Associate or Licentiate, £3 3*s*.
This reduction will take effect from 1 January 1948.

Grants: The Council have approved the following grants for the year 1947-48:
To the Council for the Preservation of Rural Wales, £3 3*s*.
To the Association for the Preservation of Rural Scotland, £5 5*s*.

Membership: The following members were elected: as Hon. Corresponding Members, 5; as Fellows, 19; as Associates, 68; as Licentiates, 27.

Applications of Election: Applications were approved as follows: *Election 9 December* 1947: as Honorary Fellow, 1; as Fellows, 6; as Associates, 280; as Licentiates, 22. *Election 9 March* 1948—*Overseas Members*: as Fellows, 4; as Associates, 12. *Students*: 237 Probationers were elected as Students.

Applications for Reinstatement: The following applications were approved: as Fellow, Mohammed Fayazuddin; as Associates, John James Bayne Gibb, Mrs. Eileen Heywood.

Resignations: The following resignations were accepted with regret: Lawrence Lee Bright [*A*], John Brabant Craggs [*A*], Framroz Nowroji Gilder [*A*], William David Jeater [*A*], Mrs. Elizabeth Margaret Parsons [*A*], George Bloore [*L*], Edwin Bickford Tregoning [*L*], Arthur Whitaker [*L*], Christopher James Ward [*Retd. L*], Frederick Candy Wren [*Retd. L*], Christopher Simpson [*Retd. L*].

Applications for Transfer to Retired Members' Class under Bye-law 15: The following applications were approved: as Retired Fellow, George John Skipper; as Retired Licentiates, James William Crawford, James Thomson, John Clifford Williams, Leslie Elliott Williamson.

Obituary: The Secretary reported with regret the deaths of the following members:
The Right Hon. Viscount Lee of Fareham, G.C.B., G.C.S.I., G.B.E. [*Hon. F*].
Professor Anthony Sciortino (Hon. Corresponding Member).
Richmond Harold Shreve (Hon. Corresponding Member).
William George Ingram [*F*].
Thomas Geoffry Lucas [*F*].
Mr. Lucas was Godwin Bursar 1912. He was also a former member of the Council and of the Art Standing Committee and an Hon. Examiner (Architecture).
James Andrew Minty [*F*].
Wilfred Scotter Owen [*F*].
William Gordon Parkin [*F*].
Percy Tom Runton [*F*].
Granville Edward Stewart Streatfeild [*F*].
Mr. Streatfeild was a former member of the Town Planning and Housing Committee.
Harold Ogle Tarbolton, R.S.A. [*F*].
Mr. Tarbolton was a former President of the Edinburgh Architectural Association and had represented that body on the R.I.B.A. Council.
Henry Francis Traylen [*F*].
Mr. Traylen was a former President of the Northants, Beds and Hunts Association of Architects, and had represented that body on the R.I.B.A. Council and the Allied Societies' Conference.
Oscar Wilson [*F*].
Mr. Wilson was a former Secretary of the Institute of Architects of Malaya.
Charles Edward Bateman [*Retd. F*].
Mr. Bateman was a former member of the Council, the Prizes and Studentships Committee and the Official Architecture Committee, and a former President of the Birmingham Architectural Association.
Henry Leonard Gauntlett Hill, O.B.E. [*Retd. F*].
Alexander Nisbet Paterson, A.R.S.A. [*Retd. F*].
Mr. Paterson was Godwin Bursar 1896. He was also a former member of the Council, the Royal Gold Medal Committee, the Official Architecture Committee and the Unification and Registration Committee, and a former President of the Royal Incorporation of Architects in Scotland, and representative of that body on the Allied Societies' Conference.
James Hubert Chaundler [*A*].
John Gordon Dower [*A*].
Mr. Dower was a representative of the R.I.B.A. on the Council for the Preservation of Rural England. He was also Secretary and later Honorary Secretary of the Aerodromes Committee, and a former member of the Public Relations Committee.

Henry Andrew Johnson [*A*].
William Robert Simpson [*A*].
Robert Arthur Reeve [*Retd. A*].
Claude Arrowsmith [*L*].
Cuthbert John Broderick [*L*].
Harry Clayton [*L*].
Norman Halliwell [*L*].
Andrew M. McKinlay, [*L*].
John Alexander Carfrae [*Retd. L*].
William Thomas Springall [*Retd. L*].
Denis Westwood Bright (Student).
Gerard Edmund Counsellor Hemelryk (Student).

It was resolved that the regrets of the Royal Institute for the loss it had sustained in the decease of these members be entered in the minutes of the meeting and that a vote of sympathy and condolence be passed and communicated to their relatives.

Membership Lists

ELECTION: 14 OCTOBER 1947

The following candidates for membership were elected on 14 October 1947.

AS HON. CORRESPONDING MEMBERS (5)

Jofan: Boris, Moscow.
Mordvinoy: Arcadi, Moscow.
Shioussev: Alexi, Moscow.
Vesnin, Victor, Moscow.
Zheltovsky: Ivan, Moscow.

AS FELLOWS (19)

Coombes: Robert Edwin Montagu, J.P. [*A* 1926], Lincoln.
Costello: Frank Gibson [*A* 1936], Brisbane.
Dotto: Augustine Louis [*A* 1932], Gibraltar.
Eley: Thomas Henry [*A* 1933].
Hill: Frederick Alexander Rowland, A.M.T.P.I. [*A* 1940], Redditch.
Holman: Edward [*A* 1931], Birmingham, 2.
Mathews: Edmund Douglass Jefferiss, O.B.E. [*A* 1939].
Mhatre: Gajnan Baboorao [*A* 1931], Bombay.
Morley: Francis Henry [*A* 1912], Liverpool.
Pryce Lewis: Owen, A.A. Dipl. [*A* 1934], Cape Town.
Soden: Armand Wilmshurst [*A* 1934].
Stoddart: Robert William [*A* 1920].
Walkden: John Stanley, Dist.T.P., M.T.P.I. [*A* 1929].

And the following Licentiate who has passed the qualifying Examination:

Haslam: Frank Claude, P.W.D., Lagos.

And the following Licentiates who are qualified under Section IV, Clause 4 (*c*) (ii) of the Supplemental Charter of 1925:

Beer: Ernest Victor, Exeter.
Currie: Robert Thom.
Elkins: Charles Henry, P.A.S.I., Warwick.
Holdsworth: Ledgar, Wakefield.
Williams: Harold Percy.

AS ASSOCIATES (68)

Barry: Robin Lewis.
Bates: Sidney Henry.
Battiscombe: John Henry.
Beasley: Michael David.
Bender: Holwell Charles Courtney.
Beresford: Jack, Doncaster.
Biel: Hans.
Brustmeyer: Edmund John Valentine, Cape Town.
Chan: Kwok Koon, Shanghai.
Chapman: Charles William Ernest.
Conder: Hugh Neville.
Cordwell, John Donald.
Cousins: James Sydney.
Cross: Elizabeth Mary (Miss).
Curry: Harold Wathen, Dewsbury.
Ellis: Samuel Arthur Gordon, M.B.E., Pretoria.
Farmer: Joan (Miss).
Fisher: Carl.
Fort: Nicholas, Washington, Co. Durham.
Fowkes: Eric Stuart, Beverley.
Gardiner: George Clifford, Liverpool.
Gillespie: Barton Vernon, Auckland.
Godfrey: Eleanor (Miss).
Gordon: Harold John.
Graham: Robert Malcolm.
Griffiths: Jean Megan (Miss).
Hawkins: Francis Fred, Boscombe.
Herriott: James Morris, Norwich.
Herrmann: Fritz Heinrich Joseph.
Hickley: William Dennis.
Hill: Christopher Benson, Leeds.
Jack: Alexander Duncan, Salisbury, Southern Rhodesia.
Johns: Ernest Dudley, Sydney.
Kruss: Solomon, Rondebosch, Cape.
Lasersohn: Lazar, Johannesburg.
Lomas: Charles Anthony.
McGegan: James Edward Peter.
Maclaurin: Ian Graeme, Alton, Hants.
Maltby: Selina Rosemary (Miss).
Marshall: Roger Herbert Percival.
Matthews: Gordon Edward.
Mitchell: Ronald Henry.
Morris: William Rowland, Shanghai.
Murray: Atholl James, Johannesburg.
Neal: Arnold Walter, Pukekohe, New Zealand.
Nicholas: Sydney Eric.
Owen: Hugh.
Page: Robert, Taunton.
Piper: Keith Llewellyn, Auckland.
Raynham: James Ernest.
Rice: Stanley Russell, Southland, New Zealand.
Robson: Christopher Elic, Sunderland.
Rosenberg: Gerhard, A.M.T.P.I.
Sakkides: Nicos Onoufriou, A.M.T.P.I., Limassol, Cyprus.
Smith: Norman Clarence, Melbourne.
Slater: John Moore.
Taylor: John Drury Meade, M.A.Cantab.
Taylor: Ronald, Ferring, Nr. Worthing.
Tyler: Richard Michael Townsend.
Van der Merwe: Johannes David, Citrusdal, C.P., South Africa.
Ward: Bernard Valentine, Southsea.
Warren: Bernard Francis, Sheffield.
Whitaker: Edward Anthony, Sheffield.
Wight: Jack Fraser, Wanganui, New Zealand.
Wilson, Stuart Anthony, Montreal.
Wood: Kenneth Martin, Newcastle-on-Tyne.
Wright: Edward Stephen.
Yuille: William Loddon, B.Arch., Mosman, New South Wales.

AS LICENTIATES (27)

Arnfield: Sherratt Martin, Manchester.
Beales: Reginald Woodhouse, Ipswich.
Bolton: John, Glasgow.
Brooke: John Henry.
Brooksbank: Frank James Frederick.
Duggan: Herbert Augustine Nelson.
Francis: John Henry Melville.
Gomersall: Ronald, Bridlington.
Gordon: James John, Edinburgh.
Hannen: Cecil May.
Hawks: Claude.
Horsham: Ronald John Eric.
Last: Leonard William.
Lee: Frederick Cecil, Stoke-on-Trent.
Lenton: John Edward, Newport, Mon.
Long: Edward George.
Mitton: Edward Stanley.
Rowe: Ernest Ronald.
Sadler: James.
Sinclair: Peter, Methil, Fife.
Smail: Herbert Morgan, O.B.E., T.D., Dundee.
Smale: William George, A.R.I.C.S.
Smart: Cephas Roland Allen, Dudley.
Taylor: Robert Henderson: Edinburgh.
Thraves: Lionel Alfred, Nottingham.
Vicary: Frederic Leslie (Capt., R.E.).
Ward: Gordon Willatt.

ELECTION: 9 DECEMBER 1947

An election of candidates for membership will take place on 9 December 1947. The names and addresses of the candidates, with the names of their proposers, found by the Council to be eligible and qualified in accordance with the Charter and Bye-laws, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday 6 December 1947.

The names following the applicant's address are those of his proposers.

AS HONORARY FELLOW (1)

H.R.H. The Princess Elizabeth, Buckingham Palace. Proposed by the Council.

AS FELLOWS (6)

Fairtlough: Andrew Charles [*A* 1938], 8/9 Long Acre, W.C.1; West Moushill, nr. Godalming, Surrey. W. B. Simpson, A. W. D. Reid, Frederick Etchells.

Mollison: William [*A* 1931], The County of London Electric Supply Co. Ltd., County House, 46/47 New Broad Street, E.C.2; 19 Birchwood Road, Petts Wood, Kent. George Fairweather, Wm. Salmond, C. G. Soutar.

Moncrieff: Harry [*A* 1932], 177 Vauxhall Bridge Road, S.W.1; 13 New Street Hill, Bromley, Kent. Frederick Gibberd, H. A. Mealand, Richard Nickson.

Oldacre: William Bernard [*A* 1926], Lloyds Bank Chambers, Newcastle-under-Lyme, Staffs; Hanchurch Yews, Hanchurch, Trentham, Staffs. George Hollins, W. R. Davidge, J. B. Adams.

Winston: Denis, M.A., B.Arch (L'pool), M.T.P.I. [*A* 1932], Civic Centre, Southampton; Botley Grange, Botley, Hants. Prof. Sir Charles Reilly, Prof. Sir Patrick Abercrombie, J. H. Forshaw.

And the following Licentiate who has passed the qualifying Examination:

Humphrys: Derrick Raymond, 112, Gloucester Place, W.1. Eric Ambrose, K. E. Black, N. F. Cachemaille-Day.

AS ASSOCIATES (280)—

The name of a school, or schools, after a candidate's name indicates the passing of a recognized course.

Adams: Ernest George Young [Final], 171 Shepherds Lane, Dartford, Kent. S. C. Ramsey, K. D. P. Murray, C. S. White.

Adams: George Robert, D.F.C. (Bartlett Sch. of Arch.: Univ. of London), 6 Compton Road, Brighton, Sussex. Prof. H. O. Corfiato, D. du R. Aberdeen, K. E. Black.

Alderson: Joan Lorna (Miss) (Victoria Univ., Manchester: Sch. of Arch.), 61 Scarsdale Road, Victoria Park, Manchester, 14. F. L. Halliday, J. S. Beaumont, Prof. R. A. Cordingley.

Allen: Frances Evelyn (Miss) [Final], Forge House, Hurstpierpoint, Hassocks, Sussex. J. L. Denman, K. E. Black, S. H. Tiltman.

Altham: Charles Joseph (Victoria Univ., Manchester: Sch. of Arch.), Staden Manor, Buxton, Derbyshire. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Anderson: Robert [Special Final], 50 South Side, Clapham Common, S.W.4. A. F. W. Reading, C. W. Box, A. G. Alexander.

Atkinson: Harry Hartley, B.Arch. (Durham) (King's Coll. (Univ. of Durham) Newcastle-upon-Tyne, Sch. of Arch.), 44 Wingrove Road, Newcastle-on-Tyne. Prof. W. B. Edwards, R. N. MacKellar, G. H. Harding.

Baldwin: Thomas Allan [Final], 14 North Square, Hampstead Garden Suburb, N.W.11. G. D. Harbron, Allanson Hick, W. B. Wheatley.

Balkwill: Roger Lanyon (Arch. Assoc. (London): Sch. of Arch.), 6 Southwood Court, Northway, Hampstead Garden Suburb, N.W.11. Applying for nomination by the Council under Bye-law 3 (*d*).

Ball: Kenneth James (Univ. of Sheffield: Dept. of Arch.), 56 Storforth Lane, Hasland, Chesterfield, Derbyshire. Stephen Welsh, H. B. S. Gibbs, H. B. Leighton.

Bancroft: Bernard [Special Final] No. 2, 52 Wells Street, W.1. C. W. Box, Kenneth Dalgliesh, R. K. Pullen.

Bardsley: Geoffrey, Dip.Arch. (Manchester) (Victoria Univ., Manchester: Sch. of Arch.), 12 Windmill Lane, Reddish, Stockport, Cheshire. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Barker: John Stanley, B.A. [Hons. Arch.] (Victoria Univ., Manchester: Sch. of Arch.), 29 Baxter Road, Sale, Manchester. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Barlow: Edward Ernest (Major) (Northern Poly. (London): Dept. of Arch.), 42 Earls Crescent, Harrow, Middx. T. E. Scott, A. J. May, P. V. Mauger.

Barrow: William Leslie [Special Final], 103 Monks Park Avenue, Horfield, Bristol, 7. H. S. Davis, L. W. Yates, T. H. B. Burrough.

Barry: Patrick Hayden [Final], Woodlands, Leigh Woods, Bristol. E. H. Button, G. D. G. Hake, T. H. B., Burrough.

Bartholomew: Victor Graham (Capt.), A.R.I.C.S. [Final], 29 Bushmoor Crescent, Shrewsbury Place, S.E.18. L. S. Stanley, J. H. Anderson, M. H. Forward.

Beech: Gerald Rushworth (Liverpool Sch. of Arch.: Univ. of Liverpool), 93 Durning Road, Liverpool, 7. Prof. L. B. Budden, Donald Brooke, J. E. Marshall.

Bellamy: Ivan Montagu [Final], 133 Watling Street, Strood, Rochester. C. W. W. Thompson, S. H. Loweth, R. T. Green.

Betts: Joseph Herbert [Special Final], 45 Glynde Avenue, Hampden Park, Eastbourne. C. W. Box, F. C. Benz, K. F. Wray.

Bidmead: Rowland John [Special Final], 'The Trees', Coppenhall, Stafford. A. C. H. Stillman, W. T. Benslyn, H. T. Buckland.

Bishop: Harold Charles [Final], 12 Copse Avenue, West Wickham, Kent. L. G. Pearson, T. S. Tait, Dr. Charles Holden.

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Mort: William Idwal [Special Final], 24 Acton Gardens, Wrexham, Denbighshire. E. M. Parkes, P. H. Lawson, F. C. Saxon.

Mortimer: Elizabeth Grant (Mrs.), Dip.Arch. (Leeds) (Leeds Sch. of Arch.) M. Y. 'Yanina', Clifton Ferry, York. Applying for nomination by the Council under Bye-law 3 (*d*).

Munro: Ian Archibald (Edinburgh Coll. of Art: Sch. of Arch.), 'The Croft', Dochfour Drive, Inverness. A. H. Mottram, the late H. O. Tarbolton, J. R. McKay.

Murray: John Thomas (Liverpool Sch. of Arch.: Univ. of Liverpool), Holly Mount, Rawtenstall, Rossendale, Lancs. Prof. L. B. Budden, Donald Brooke, B. A. Miller.

Naglovsky: Alexander (Bartlett Sch. of Arch.: Univ. of London), 46 Beaumont Court, W.4. Prof. H. O. Corfiato, Stewart Thomson, H. I. Ashworth.

Naylor: Olga Mary Wilson (Miss), B.A. (Sheffield) (Univ. of Sheffield: Dept. of Arch.), 4 Slayleigh Avenue, Sheffield, 10, Yorks. Stephen Welsh, Robert Cawkwell, H. B. Leighton.

Neale: Peter Walter James [Special Final], 163 Stechford Road, Birmingham, 8. W. T. Benslyn, H. W. Hobbiss, Frank Wager.

Neil: Robert [Special Final], The Cloisters, High Street, Bushey, Herts. Joseph Weekes, P. G. J. Carter, L. S. Stanley.

Newman: Stanley Ashley, Dip.Arch.(Lond.) Dip.T.P.(Lond.) (Bartlett Sch. of Arch.: Univ. of London), 116 Chiltern Court, Baker Street, N.W.1. Prof. H. O. Corfiato, L. S. Stanley, Edwin Williams.

Nichol: Richard James (The Poly., Regent Street, London: Sch. of Arch.), 8 Elmwood, Welwyn Garden City, Herts. C. W. Fox, P. V. Mauger, J. K. Hicks.

Norfolk: Derek Evelyn Whiteway [Final], 69 Braybon Avenue, Brighton, 6. K. E. Black, G. M. Trench, F. F. Howard.

Oates: John Rollinson (Major), Dip.Arch. (Sheffield) (Univ. of Sheffield: Dept. of Arch.), 'Holmsfield', 54 Blyth Road, Worksop, Notts. Stephen Welsh, H. B. S. Gibbs, H. B. Leighton.

Oldfield: Peter Lawrence, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 39 Shire Lane, Chorley Wood, Herts. Prof. L. B. Budden, J. E. Marshall, Donald Brooke.

O'Neill: Vincent Hilary [Special Final], 41 Eccles Street, Dublin. Raymond McGrath, J. O'H. Hughes, Vincent Kelly.

Owen: Alice Elizabeth Pamela (Miss) (Edinburgh Coll. of Art: Sch. of Arch.), 39 Truscott Avenue, Bournemouth, Hants. G. D. Harbron, Allanson Hick, W. B. Wheatley.

Parker: William James (passed a qualifying Exam. approved by the Institute of South African Architects), 17 Bernard Street, W.C.1. Theophile Schaerer and applying for nomination by the Council under Bye-law 3 (*d*).

Parsons: Howard Christopher [Special Final], Shrubbery Cottage, High Street, Yatton, Somerset. A. F. French, E. H. Button, T. H. B. Burrough.

Partington: Richard Scott (Victoria Univ., Manchester: Sch. of Arch.), 22a Sapling Road, Bolton, Lancs. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Paterson: James (Edinburgh Coll. of Art: Sch. of Arch.), 4 Stafford Street, Edinburgh, 3. J. R. McKay, T. F. MacLennan, A. H. Mottram.

Patience: Maurice Balfour (Univ. of Sheffield: Dept. of Arch.), 199 Nidd Road, Sheffield, 9. Stephen Welsh, H. B. S. Gibbs, H. B. Leighton.
Paul: Ernest Henry [Special Final], 162 Walton Street, Oxford. R. F. Wheatly, H. F. Hurcombe, C. W. Box.

Peake: Basil Maxwell (Arch. Assoc. (London): Sch. of Arch.), 64 Courtfield Gardens, S.W.5. R. F. Jordan, R. E. Enthoven, A. R. F. Anderson.

Pearson: John Henry [Special Final], 285 Marton Road, Middlesbrough. L. S. Stanley, F. Mellor, R. R. Kitching.

Pepperell: David Garth [Final], 11 Dundonald Road, Redland, Bristol, 6. T. A. Skinner, E. H. Button, D. R. Aberdeen.

Pethybridge: Robert Edward [Special Final], 5 The Crest, Goffs Oak, Herts. T. E. Scott, Graham Dawbarn, F. R. S. Yorke.

Phillips: Leonard William Charles [Final], 13 Lysias Road, Balham, S.W.12. G. H. Goldsmith, C. W. Box, R. G. Covell.

Pite: Frederick Robert [Final], 'Hursley', 54 The Drive, Sevenoaks, Kent. R. W. Pite, H. S. Goodhart-Rendel, C. J. Cable.

Platt: Geoffrey Parker [Final], 5 Glebelands Road, Prestwich, Manchester. W. A. Johnson, H. T. Seward, J. S. Beaumont.

Pollitt: Eric [Final], 34 Princesway, Wallasey, Cheshire. W. A. Johnson, Bertram Ashworth, S. McLauchlan.

Powell: Patrick John Lowry [Special Final], 106b Banbury Road, Oxford. E. M. Rice, H. F. Hurcombe, C. W. Box.

Price: Arthur Gwynne [Final], 3 Station Road, Treorchy, Rhondda, South Wales. Lewis John, A. G. Lynham, Morgan Willmott.

Price: John Montague Pembroke (Arch. Assoc. (London): Sch. of Arch.), 52 Redcliffe Road, Kensington, S.W.10. Frederick Gibberd, Richard Sheppard, A. M. Chitty.

Prichard: Victor Henry Sydney [Final], Walford House, West Monkton, nr. Taunton, Somerset. R. O. Harris, H. S. W. Stone, E. H. Paisley.

Prower: Aubrey Edward [Final], 16 Gloucester Place, Portman Square, W.1. H. A. Welch, F. J. Lander, Paul Mauger.

Pryce: Margaret Eleanor (Miss) (Arch. Assoc. (London): Sch. of Arch.), 25 Heathdene Road, Wallington, Surrey. George Fairweather, R. F. Jordan, Frederick Gibberd.

Purser: John (Arch. Assoc. (London): Sch. of Arch.), 53 Stanley Road, Ashford, Middx. E. Forster, A. R. F. Anderson, John Grey.

Ramsay: James [Special Final], 15 Orchard Road, Hook, Surbiton, Surrey. W. J. Smith, Austin Vernon, L. A. Chackett.

Ramsbottom: Denis Hannibal (Victoria Univ., Manchester: Sch. of Arch.), 'Arundel', Whalley Road, Accrington, Lancs. Prof. R. A. Cordingley, J. P. Nunn, G. N. Hill.

Reade: Edna Eileen (Mrs.), B.A.(Hons.Arch.) (Victoria Univ., Manchester: Sch. of Arch.), 119b Palatine Road, West Didsbury, Manchester. Prof. R. A. Cordingley, F. L. Halliday, J. P. Nunn.

Riley: Eric William [Final], 69 Browning Road, Manor Park, E.12. A. S. Belcham, C. C. Shaw, and applying for nomination by the Council under Bye-law 3 (*d*).

Roberts: Owen Nedwill, B.Arch.(Hons.) (L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 86 Bedford Street South, Liverpool, 7. Prof. L. B. Budden, Donald Brooke, J. E. Marshall.

Roberts: Ruth Mary (Mrs.), (Arch. Assoc. (London): Sch. of Arch.), Flat Five, 4 Polworth Road, S.W.16. L. H. Bucknell, Donald Jack, P. V. Mauger.

Robertson: Neil McLeod (King's Coll. (Univ. of Durham), Newcastle-upon-Tyne, Sch. of Arch.), 3 Western Terrace, East Boldon, Co. Durham. G. T. Brown, S. W. Milburn, R. N. MacKellar.

Robinson: Alfred William (Univ. of Sheffield: Dept. of Arch.), 'Whirlow', 86, Warnford Road, Iford, Bournemouth. Stephen Welsh, W. G. Davies, H. B. S. Gibbs.

Robinson: Douglas Varley (Leeds Sch. of Arch.), 'Wyndhurst', Utley, Keighley, Yorks. A. C. Light, G. H. Foggitt, C. Medley.

Robinson: Neil Gunn, Dip.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 72 Sandy Lane, West Kirby, Wirral, Cheshire. Prof. L. B. Budden, Donald Brooke, B. A. Miller.

Rodd: Margaret Janet (Miss) (The Poly., Regent Street, London: Sch. of Arch.), 12 Village Way, Rayners Lane, Pinner, Middx. E. C. Scherrer, J. K. Hicks, L. A. Chackett.

Rothen: Gordon Eric, B.A.(Arch.) (Bartlett Sch. of Arch.: Univ. of London), Windsor Cottage, Portmore Park Road, Weybridge, Surrey. Prof. H. O. Corfiato, Prof. A. E. Richardson, L. S. Stanley.

Sawyer: Peter Ross (Lt.-Col.), M.C., T.D. [Special Final], Queen Anne Chambers, Winchester. R. F. Gutteridge, C. L. Gill, A. L. Roberts.

Scollay: Edward John (Northern Poly. (London): Dept. of Arch.), Hillwood Cottage, Maybury, Woking, Surrey. T. E. Scott, P. J. Westwood, W. H. Hamlyn.

Scott: Constance Brough (Miss) (Aberdeen Sch. of Arch.: Robert Gordon's Tech. Coll.), 16 Rubislaw Terrace, Aberdeen. G. A. Mitchell, J. A. O. Allan, A. B. Gardner.

Shepherd: Alexander [Special Final], South field House, Auchtermuchty, Fife. Applying for nomination by the Council under Bye-law (*d*).

Smith: Edward Watson [Special Final], 4 Dorlonco Villas, Meadowfield, Durham City. L. S. Stanley, F. Willey, W. Milburn.

Smith: Roger Gordon [Final], 'Grove Lodge', Talbot Avenue, Bournemouth. L. S. Stanley, L. S. Youngman, L. M. Austin.

Smith: Ronald Victor Robert (Arch. Assoc. (London): Sch. of Arch.), c/o Messrs. Fairweather and Jordan, 28 Wigmore Street, W.1. George Fairweather, R. F. Jordan, Howard Robertson.

Smithson: Peter Denham (King's Coll. (Univ. of Durham), Newcastle-upon-Tyne, Sch. of Arch.), 12 Zetland Road, Stockton-on-Tees. W. B. Edwards, Lt.-Col. A. K. Tasker, R. N. MacKellar.

Soulsby: George Ernest [Special Final], 'Claremont', 30 Northdown Close, Maidstone, Kent. S. H. Loweth, R. T. Green, Richard Mellor.

Southey: Frank Lester [Special Final], 'St Annes', 112, Quarry Park Road, Cheam, Surrey. F. C. Benz, W. A. Ross, C. H. Murray.

Stansfield: John Cameron Oddy [Special Final], Thorn Cottage, Moor Lane, Strensall, York. Kenneth Ward, C. W. C. Needham, W. A. Banks.

Stillman: John Cecil (Bartlett Sch. of Arch., Univ. of London), 1 York House, Highbury Crescent, N.5. Prof. H. O. Corfiato, Prof. A. E. Richardson, G. R. Dawbarn.

Stroud: Harry Augustus [Special Final], 8 Wordsworth Drive, Cheam, Surrey. C. W. Box, W. R. H. Gardner, E. A. Jackson.

Swain: Paul Bryan O'Brien (Arch. Assoc. (London): Sch. of Arch.), 'Les Bois', St. Peter, Jersey, C.I. L. H. Bucknell, P. J. Westwood, and applying for nomination by the Council under Bye-law 3 (*d*).

Swann: Peter William (The Poly., Regent Street, London: Sch. of Arch.), 8 The Shrubbery, Grove Road, Wanstead, E.11. Joseph Addison, J. K. Hicks, E. C. Scherrer.

Swift: Stanley [Special Final], 25 Newbold Street, Leamington Spa, Warwicks. J. P. Bridgwater, T. G. Crump, A. C. Bunch.

Sykes: Leslie Ernest (Victoria Univ., Manchester: Sch. of Arch.), 16 Groby Road, Audenshaw, nr. Manchester. Prof. R. A. Cordingley, G. B. Howcroft, J. P. Nunn.

Symes: John Jeffrey [Special Final], The Barn Wing, Godshill, Isle of Wight. Sydney Gregson, Ronald Ward, Vernon Aldridge.

Taylor: John Spencer, Dip.Arch.(Manc.) (Victoria Univ., Manchester: Sch. of Arch.), 34 Stansfield Road, Todmorden. Prof. R. A. Cordingley, J. P. Nunn, Edgar Sutcliffe.

Taylor: Kenneth Royle (Victoria Univ., Manchester: Sch. of Arch.), 21 Parr Fold Avenue, Walkden, Manchester. Prof. R. A. Cordingley, J. P. Nunn, Benjamin Waterhouse.

Tempest: Ronald (Leeds Sch. of Arch.), 14 Pontefract Road, Rothwell, Leeds, Yorks. Applying for nomination by the Council under Bye-law 3 (*d*).

Terry: John Hankinson (Victoria Univ., Manchester: Sch. of Arch.), Cwmllan, Llanychlwydog, nr. Fishguard, Pembs. Prof. R. A. Cordingley, J. P. Nunn, Gerald Sanville.

Tomlin: Elizabeth Catherine (Miss), Dip.Arch. (Manc.) (Victoria Univ., Manchester: Sch. of Arch.), 16 Chandos Road South, Manchester.

21. Prof. R. A. Cordingley, F. L. Halliday, Benjamin Waterhouse.

Tucker: Ernest Frank [Final], 'Heatherton', Furzehatt Road, Plymstock, S. Devon. E. U. Channon, Lt.-Col. F. J. Taylor, J. L. Fouracre.

Van der Steen: Joseph William [Special Final], 122 Cat Hill, E. Barnet, Herts. W. J. Durnford, R. Wilson, G. W. Home.

Variava: Dara Rustomji (Victoria Univ., Manchester: Sch. of Arch.), 46 Denison Road, Victoria Park, Manchester, 14. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Vere: Stanley [Final], 108 Singleton Avenue, Prenton, Birkenhead. Applying for nomination by the Council under Bye-law 3 (*d*).

Vernon: Russell Geoffrey Duddell, M.B.E. [Special Final], 193 Rosendale Road, West Dulwich, S.E.21. Austin Vernon, E. B. Glanfield, J. W. Buchanan.

Versino: Andrea George [Final], 64 Mead Way, Coulsdon, Surrey. Niel Martin-Kaye, T. A. Lodge, Allan Johnson.

Villar: Pamela Mary [Miss] (Arch. Assoc. (London): Sch. of Arch.), Danehurst, Locksheath, nr. Southampton. Richard Sheppard, Frederick Gibberd, George Fairweather.

Vint: George Branwell [Special Final], 26 Sutton Road, Muswell Hill, N.10. G. M. Trench, T. G. Jackson, C. E. Culpin.

Vinycomb: June Hilaby (Miss) (Arch. Assoc. (London): Sch. of Arch.), 14 Brockett Close, Welwyn Garden City, Herts. George Fairweather, Howard Robertson, A. M. Chitty.

Walker: Denis Vivan Campbell [Special Final], 51 Cadogan Street, S.W.3. Prof. H. O. Corfiato, W. A. Rutter, L. S. Stanley.

Walker: James Reginald (Leeds Sch. of Arch.), 53 Walkley Lane, Heckmondwike, Yorks. Applying for nomination by the Council under Bye-law 3 (*d*).

Ward: Ian Dorrington (Arch. Assoc. (London): Sch. of Arch.), 20 Clinton Crescent, St. Leonards-on-Sea, Sussex. R. F. Jordan, Robert Atkinson, F. D. Ward.

Watson: Alexander (Aberdeen Sch. of Arch., Robert Gordon's Tech. Coll.), 18 Queen's Gate Place, S.W.7. G. A. Mitchell, H. C. Mason, O. F. Savege.

Watson: Alexander [Final], 40 Paisley Crescent, Edinburgh, 8. W. A. Ross, J. F. Matthew, J. S. Johnston.

Weaver: Edward Harry [Final], 73 Queens Road, High Wycombe, Bucks. R. G. Brocklehurst, E. A. L. Martyn, George Vey.

Weinmann: Gunter Alfred [Special Final], 1 Harford Walk, N.2. W. R. Davidge, W. E. Watson, S. C. Ramsey.

Whiffen: Robert Flury [Special Final], 21 Tekels Park, Camberley, Surrey. F. H. Adie, F. C. Button, E. L. Gale.

Whitfield: Kenneth Waltham (Liverpool Sch. of Arch.: Univ. of Liverpool), 32 Huskisson Street, Liverpool. Prof. L. B. Budden, B. A. Miller, D. Brooke.

Whittle: John Parkinson, B.A.(Hons.Arch.) (Victoria Univ., Manchester: Sch. of Arch.), 34 Lammack Road, Blackburn, Lancs. Prof. R. A. Cordingley, J. P. Nunn, F. L. Halliday.

Wightman: Henry Hunter (Aberdeen Sch. of Arch., Robert Gordon's Tech. Coll.), 11 Ruthven Street, Auchterarder, Perthshire. E. F. Davies, W. E. Thomson, R. M. Mitchell.

Willcox: Beresford Maurice (The Poly., Regent Street, London: Sch. of Arch.), Greylock, Orley Farm Road, Harrow, Middlesex. E. C. Scherrer, J. K. Hicks, L. A. Chackett.

Williams: Dilwyn Christopher (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 'Glasfryn', Melton Drive, Bridgend, Glam. Lewis John, Sir Percy Thomas, T. A. Lloyd.

Williams: Harry (Liverpool Sch. of Arch.: Univ. of Liverpool), 'Arnon', Abbey Road, Llangollen, North Wales. Prof. L. B. Budden, Donald Brooke, B. A. Miller.

Williams: John Stanley [Special Final], 402 Victoria Avenue East, New Moston, Manchester, 10. Ernest Prestwich, L. S. Stanley, W. C. Young.

Williams: William Thomas [Special Final], 3 Chepstow Villas, W.11. Applying for nomination by the Council under Bye-law 3 (*d*).

Wilson: Bernard (Liverpool Sch. of Arch.: Univ. of Liverpool), 55 Mount Road, Wallasey, Cheshire. Prof. L. B. Budden, Donald Brooke, B. A. Miller.

Wilson: Doreen Eva Margaret (Miss) (King's Coll. (Univ. of Durham), Newcastle-upon-Tyne: Sch. of Arch.), 7 Westcroft Road, Forest Hall, Newcastle-on-Tyne. Prof. W. B. Edwards, R. N. MacKellar, C. A. Harding.

Wills: Samuel Kennedy, Dip.Arch.(Manc.) (Victoria Univ., Manchester: Sch. of Arch.), The Glen, Carrickfergus, Co. Antrim, N. Ireland. Prof. R. A. Cordingley, R. H. Gibson, T. R. Eagar.

Wood: Cyril Raymond Meldrum [Final], 21 Bathgate Drive, Strandtown, Belfast. T. R. Eagar, R. H. Gibson, J. R. Young.

Woods: Roy [Final], 52 Manor Road, Burton-on-Trent. H. G. Stanham, A. F. Stanham, L. S. Stanley.

Wright: Isoult de Valence (Miss) (Arch. Assoc. (London): Sch. of Arch.), 206 Howard House, Dolphin Square, S.W.1. L. H. Bucknell, A. M. Chitty, R. F. Jordan.

Zegleman: Hyam (Glasgow Sch. of Arch.), 249 Allison Street, Glasgow, S.2. J. Weekes, W. J. Smith, J. A. Coia.

AS LICENTIATES (22)

Baines: Edwin Roy, c/o Borough Architect's Dept., Town Hall, Walthamstow, E.17; 12 St. Peter's Street, St. Albans, Herts. Applying for nomination by the Council under Bye-law 3 (*d*).

Banks: Edward Harry, Ministry of Works, Abell House, S.W.1; 25 Grove Wood Hill, Coulsdon, Surrey. A. G. Alexander, H. T. B. Barnard, Z. Sirotkin.

Bevan: Geoffrey, c/o County Architect's Dept., Church House, 45 Regent Street, Wrexham, Denbighshire; Stanley Villa, Wrexham. Applying for nomination by the Council under Bye-law 3 (*d*).

Bradshaw: Leonard Robert, War Office, Romney House, Marsham Street, S.W.1; 64 Peartree Road, Enfield, Middlesex. W. A. Ross, A. Thomerson, F. J. Searley.

Clements: Arthur Palmer, c/o Council Offices, Blaby R.D.C., Narborough, Leicester; 248 Fosse Road South, Leicester. A. F. Bryan and the President and Hon. Sec. of the Leicester and Leicestershire Soc. of Arch. under Bye-law 3 (*a*).

Clunie: William Lambie, c/o City Architect's Dept., Town Hall, Sheffield; 30 Marsh Lane, Crosspool, Sheffield, 10. Stephen Welsh, W. G. Davies, H. B. S. Gibbs.

Illingworth: Marcus Stewart (Capt. R.E.), Messrs. Cook and Culling, Market Street, Kettering; 339 Bath Road, Kettering. H. R. Surridge, Charles Riddey, Walter Rosser.

Illingworth: William Douglas (Capt.), F.R.I.C.S., 15 Sunbridge Road, Bradford; 1 Ashfield Road, Moorhead, Shipley. Eric Morley, Victor Bain, H. W. Barker.

Jolly: George James, E.10. War Office, London; 127 Faraday Avenue, Sidcup, Kent. W. A. Ross, F. J. Searley, Frederic Towndrow.

Kettlewell: William Clifford, Ministry of Works, Government Buildings, Lawnswood, Leeds, 6; 119 Ring Road, Crossgates, Leeds. W. H. King and the President and Hon. Sec. of the West Yorks Soc. of Arch. under Bye-law 3 (*a*).

Konrad: Joseph, 30 Wolfreton Lane, Willerby, Hull. G. D. Harbron, Allanson Hick, R. G. Clark.

Miller: Albert Lenis, R.O.F. Ministry of Supply, Glascoed, S. Wales; 158 The Highway, Pontypool Road, Pontypool, Mon., S. Wales. F. A. Roberts, C. F. Bates, G. H. Davies.

Page: James, Surveyor's Dept., Messrs. Fredk. Smith Ltd., Aston Model Brewery, Birmingham, 6; 54 Olorenshaw Road, Sheldon, Birmingham, 26. H. W. Hobbiss, S. J. Stainton, S. N. Cooke.

Palmer: Norman, c/o Architect's Dept., East Suffolk County Council, Ipswich; 60 Medway Road, Ipswich. E. J. Symcox and the President and Hon. Sec. of the Suffolk Assoc. of Arch. under Bye-law 3 (*a*).

Palmer: Ralph Colchester, c/o Messrs. Porte and Partners, 16-17 Devonshire Square, E.C.2; 'Leydendene', 11 Vicarage Gardens, Clacton-on-Sea, Essex. Applying for nomination by the Council under Bye-law 3 (*d*).

Pearce: Harold, c/o Chelsea Borough Council; 36 Mulberry Close, Chelsea, S.W.3. Paul Phipps, A. S. G. Butler, T. J. Lynch.

Rowland: Gordon Arthur George, Associated British Cinemas, Colquhoun House, Broadwick Street, W.1; 6 Dartmouth Road, Hayes, Bromley, Kent. R. Sharpe Hill, L. H. Kemp, W. J. King.

Saunders: George Gerald Girling, 51 Queen Street, Exeter, Devon; 52 Old Tiverton Road, Exeter. P. H. Thomas, J. Bennett, E. E. Kemeys-Jenkins.

Speed: Cecil John, c/o City Architect's Dept., Portsmouth; 401 Commercial Road, Portsmouth. V. G. Cogswell, A. J. Sharp, A. C. Townsend.

Thomas: Lionel Willoughby, c/o Architect's Office, Messrs. J. Lyons and Co. Ltd., Cadby Hall, W.14; 37 Whitefriars Drive, Harrow, Middx. Applying for nomination by the Council under Bye-law 3 (*d*).

Vaughan: Richard Field Gilbert, c/o Messrs. Lucas, Roberts and Brown, Barnfield Hill, Exeter; 'Woodacre', Christow, nr. Exeter. J. Bennett, J. Challice, F. W. Beech.

Wollenberg: Adolf, 77 South Audley Street, W.1. Howard Robertson, G. Grey Wornum, Arthur Ash.

ELECTION: 9 MARCH 1948

An election of candidates for membership will take place on 9 March 1948. The names and addresses of the overseas candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday 21 February 1948.

The names following the applicant's address are those of his proposers.

AS FELLOWS (4)

Draffin: Malcolm Keith, M.C., M.T.P.I., N.Z. [*A* 1920], 810 South British Insurance Building,

Auckland, N.Z.; 18 Wynyard Street, Auckland, C.1, N.Z. W. H. Gummer, C. R. Ford, and applying for nomination by the Council under Bye-law 3 (*d*).

Li: Hin Lung [*A* 1937], 310a York Building, Hong Kong; 9 Breezy Terrace, Hong Kong. Prof. L. B. Budden, Donald Brooke, J. E. Marshall.

McWilliams: Herbert Hastings [*A* 1931], Lowcliffe House, Port Elizabeth, South Africa; The Poop, Port Elizabeth, South Africa. W. J. McWilliams, James Morris, F. M. Glennie.

Watson: William Irving (*A* 1932), Chief Architect, Public Works Dept., Government Offices, Lusaka, Northern Rhodesia. Col. J. R. Pigott, R. O. Harris, H. S. W. Stone.

AS ASSOCIATES (12)

The name of a school or schools after a candidate's name indicates the passing of a recognized course.

Chowdhari: Dattatraya Raghunath [Special Final], Messrs. Gregson, Batley and King, Chartered Bank Building, Fort, Bombay, India. H. F. King, C. M. Master, S. H. Parelkar.

Eeles: Clive Thomas (passed a qualifying Exam. approved by the R.A.I.A.), 7 Kitchener Road, Artarmon, Sydney, New South Wales. W. R. Richardson, J. C. Fowell, A. S. Robertson.

Feledy: Francis Eugene (passed a qualifying Exam. approved by the R.A.I.A.), 4 Strathfield Street, Sydney, New South Wales. Prof. A. S. Hook, W. R. Richardson, Prof. Leslie Wilkinson.

Gamble: Allan Allman (passed a qualifying Exam. approved by the R.A.I.A.), University of Architecture, Sydney, New South Wales. Prof. A. S. Hook, Prof. Leslie Wilkinson, J. C. Fowell.

Hall: John Beresford (passed a qualifying Exam. approved by the R.A.I.A.), 190 Burwood Road, Belmore, New South Wales. Prof. Leslie Wilkinson, Prof. A. S. Hook, J. C. Fowell.

Hay: Mary Clemens (Miss), B.Arch. (Univ. Coll., Auckland, N.Z.: Sch. of Arch.), 122 Grafton Road, Auckland, C.3, New Zealand. W. H. Gummer, C. R. Ford, and applying for nomination by the Council under Bye-law 3 (*d*).

Hershberg: Harry (passed a qualifying Exam. approved by the R.A.I.A.), 31 Queen Street, Melbourne, C.1, Australia. J. F. D. Scarborough, C. E. Serpell, O. A. Yuncken.

Lindsay: Ian Francis (passed a qualifying Exam. approved by the R.A.I.A.), 47 Bellett Street, Camberwell, E.6, Melbourne, Australia. J. F. D. Scarborough, C. E. Serpell, P. H. Meldrum.

Orchard: Louis Neil, D.F.C. [Final], 119b Hackthorne Road, Cashmere, Christchurch, N.Z. E. W. Armstrong, Robert Atkinson, Stanley Hamp.

Rudder: Hubert Alfred (passed a qualifying Exam. approved by the R.A.I.A.), 16 Barton Avenue, Haberfield, N.S.W., Australia. Prof. Leslie Wilkinson, B. J. Waterhouse, J. C. Fowell.

Stew: Michael, B.Arch.(Rand) (passed a qualifying Exam. approved by the I.S.A.A.), 8 Urania Street, Observatory, Johannesburg, South Africa. A. S. Furner, Robert Howden, and applying for nomination by the Council under Bye-law 3 (*d*).

Thorp: Graham Marriot (passed a qualifving Exam. approved by the R.A.I.A.), 341 George Street, Sydney, Australia. Prof. Leslie Wilkinson, F. G. Gilling, B. J. Waterhouse.

Members' Column

This column is reserved for notices of changes of address, partnership and partnerships vacant, or wanted, practices for sale or wanted, office accommodation, and personal notices other than for posts wanted as salaried assistants for which the Institute's Employment Register is maintained.

APPOINTMENTS

Mr. S. K. Joglekar [*A*] has been appointed as Town Planner in the Ministry of Works, Mines and Power, Central Public Works Dept., Government of India, New Delhi. He will be pleased to receive trade catalogues, etc. at Room 31, Attic Floor, Council House, New Delhi, India.

Mr. D. P. Hanly [*A*] has been appointed Planning Officer and Housing Architect to the Borough of Dun Laoghaire, with offices at Harbour House, Dun Laoghaire, Co. Dublin (Dublin 81700), where he would be pleased to receive trade catalogues, etc.

PRACTICES AND PARTNERSHIPS

Messrs. Braven and Cubitt [*A*/*L*], of 430 Strand, W.C.2, having dissolved partnership, Mr. Frederick Cubitt announces that he is continuing to practice from that address (Temple Bar 4953) and has also opened a South Wales office at 67 High Street, Merthyr Tydfil (Merthyr Tydfil 709).

The partnership between **Mr. D. N. Martin-Kaye** [*F*] and **Mr. Warren Neil** [*A*], under Martin-Kaye and Warren Neil, of 43 Doughty Street, W.C.1, and 11 Mint Street, Lincoln, has been dissolved as from 6 October. Mr. Martin-Kaye will continue to practice independently at 43 Doughty Street, and Mr. Warren Neil at 11 Mint Street, Lincoln, and 11 Carteret Street, London, S.W.1.

Mr. Felix Walter [*L*] and **Mr. Eric Sandon** [*A*] have amalgamated their practices under the title of **Suffolk Group,** Chartered Architects, at 1 Quay Street, Woodbridge, Suffolk (Woodbridge 546), to which address all correspondence should now be sent.

CHANGES OF ADDRESS

Mr. W. K. Ferguson [*F*] has removed from 48 Uphill Grove, Mill Hill, N.W.7, to 'Stokenhill', 289 Milton Road, Cambridge.

Mr. Basil Sutton [*F*] and **Mr. John Griffin** [*A*] have removed their practice from Baydon, Marlborough, to 87a Northbrook Street, Newbury, Berks (Newbury 411). Mr. Griffin's private address is now Walnut Tree Cottage, Chieveley, near Newbury, Berks.

Mr. L. W. Baker [*A*] has removed from 38 Western Road, Headington, Oxford, to Hillfast Cottage, Cockney Hill, Calcot, Reading.

Mr. R. A. Hopkins [*L*] has removed from 80 Buchanan Gardens, Kensal Rise, N.W.10 to 20 Pembroke Road, Greenford, Middlesex.

Mr. F. Potter [*F*] has removed to 78 Mossfield Road, King's Heath, Birmingham, 14.

Mr. E. T. Baldwin [*A*] has removed from 47 Cuphill Avenue, Coventry, to 79 Benedictine Road, Cheylesmore, Coventry.

Mr. Hugh Roberts [*F*] and **Mr. Richard H. Davies** [*A*] have removed their London office from 13 Suffolk Street, S.W.1, to 27 Grosvenor Place, S.W.1 (Sloane 7118). The Bath office remains at 7 Brock Street, The Circus. They will be pleased to receive trade catalogues, etc. at both addresses.

Mr. Mordecai Pearlman [*A*] has removed to 27 Circus Road, St. John's Wood, London, N.W.8 (Primrose 7301).

Mr. E. C. Francis [*F*] has been elected a member of the Royal West of England Academy.

Mr. Peter D. Hammond has removed to 84 Birdwood Road, Cambridge, not Birchwood Road as stated in the October JOURNAL.

Mr. J. D. Lennon, M.C. [*A*] has removed to 7 Sydney Place, S.W.7 (Kensington 4061).

Mr. Sidney Toy [*F*] has removed to St. Mary-le-Strand, Strand, W.C.2. Telephone being installed, number will be announced later.

PRACTICES AND PARTNERSHIPS WANTED AND AVAILABLE

Member with London practice would be glad to give part-time assistance to other architects. Reply Box 104, C/o Secretary, R.I.B.A.

WANTED AND FOR SALE

Wanted. Single copy of the index to Vol. 49 of the JOURNAL. Failing this, would buy complete buckram bound volume containing the index. Reply Box 99, C/o Secretary, R.I.B.A.

For Sale. Imperial Drawing Board, ebony-edged. 30s. Also set of copper stencils, various. Reply Box 103, C/o Secretary, R.I.B.A.

For Sale. Best 30-in. Brass Eidograph, complete in mahogany case, in good condition. Pre-war price £44. Accept £17 10*s*. Reply Box 95, C/o Secretary, R.I.B.A.

For Sale. Large drawing board and T-square. Also a number of architectural books. Reply Box 96, C/o Secretary, R.I.B.A.

For Sale (£2 2*s*.). Beam compass, chromium-plated. 2 ft. beam, in two lengths, with pencil, pen and divider point. Almost new. May be seen on application to the Librarian, R.I.B.A. Reply Box 100, C/o Secretary, R.I.B.A.

For Sale. *Architectural Water Colours and Etchings* (Walest), 35s., *Baroque and Rococo in Germany and Switzerland* (Popp. German text, 454 illus.), 40s., *Early Renaissance in Italy* (Baum, German text, 517 illus.) 40s., *Edifices de Rome Moderne*, Vol. 1 (Letarouilly) 7s. 6d., *Outline of Town and City Planning*, 1936 edn. (Adams) 18s., *Architects', Builders' and Civil Engineers' Technical Catalogue*, 1946, 37s. 6d., *Mechanics for Builders*, Part II (Bates and Charlesworth) 3s. Reply Box 102, C/o Secretary, R.I.B.A.

Wanted. Associate preparing for T.P.I. Final Examination wishes to purchase or borrow *The Art of Town Planning* (Lanchester), *Town Planning in Practice* (Unwin), and *Site Planning in Practice* (Thompson). Reply Box 105, C/o Secretary, R.I.B.A.

ACCOMMODATION

Elderly architect, with office furniture and small practice, desires arrangement with another firm in West End for use of 2-3 rooms, with possible share of typist. Reply Box 97, C/o Secretary, R.I.B.A.

Drawing office about 30 ft. by 15 ft. with one or two smaller rooms adjoining wanted in any part of London. Reply Box 101, C/o Secretary, R.I.B.A.